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MEXICAN INDUSTRIAL DEVELOPMENT PLANS: IMPLICATIONS FOR UNITED S--ETC(U)
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Mexican Industrial Development Plans: Implications for United States Policy



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1 April 1981

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(6) MEXICAN INDUSTRIAL DEVELOPMENT PLANS:
IMPLICATIONS FOR UNITED STATES POLICY

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THE COVER: In the hundred years since an artist executed this drawing of Monterrey, showing the Bishop's Palace and the Plaza, Mexico has been transformed into one of the world's fastest growing economies.

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PREFACE

This study was prepared to meet requirements under section 1104 of the Trade Agreements Act of 1979. The work statement for the project was developed by an interagency working group chaired by Warren H. Reynolds of this office on the basis of drafts prepared by Harvey Bale, Deputy Assistant U.S. Representative for Policy Development, Office of the U.S. Trade Representative, who is directing the interagency Section 1104 report project. The design of the work statement was prepared with the assistance of officers of the Department of State's Bureau of Economics and Business Affairs. Other agencies in this working group for the design and monitoring of the project include the Departments of Commerce, Labor, Agriculture, Treasury, Energy and the U.S. International Trade Commission.

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INTRODUCTION

In the Trade Agreements Act of 1979, the Congress of the United States required the President to undertake a study of the desirability of entering into trade agreements with other countries in North America to promote economic growth and mutual expansion of market opportunities for the United States and such countries. The study was to include an examination of competitive opportunities and conditions of competition between other countries of North America and the United States in agriculture, energy and other appropriate sectors. To provide information and analyses for this report, the U.S. Department of State requested competitive bids for a five-month study of Mexican industry and trade relations with the United States. In September, 1980, the Department awarded the study contract to Ventana Associates, Inc.

Ventana Associates is a consulting firm which specializes in commercial relations between the United States and Mexico. It offers strategic planning for companies in either country wishing to do business in the other; representation before either government; and assistance to both government and business with specific, short-term trade, investment and governmental relations problems. Headquartered in Washington, D.C., Ventana Associates maintains affiliated offices in Mexico City and Monterrey.

This study is divided into four chapters. ~~In the first chapter, Ventana describes~~ the industrial development plans of Mexico, ~~explains~~ how they were made, how planning might be accomplished in future administrations, and how effective the plans have been to date. Special emphasis is placed on an understanding of history and culture as it affects planning. ~~In the second chapter, Ventana~~ focuses on six key industrial sectors: petroleum, steel, automotive, electronic equipment, agribusiness and transportation. Each sector is analyzed to determine probable levels of production and output, likely commerce with the United States, and constraints on achieving sectoral objectives.

Chapter Three considers those constraints which cross all sectors and bear on the entire economy. Particular attention is given to inflation and related constraints common to oil-wealthy developing countries. ~~Ventana considers in this chapter~~ financial, budgetary, sectoral, infrastructural, labor and trans-

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portation constraints.¹ Finally, in Chapter Four, Ventana discusses what it considers to be~~s~~ the implications of the first three chapters as they relate to trade with the United States. Dangers which may face both countries, the need for a framework for the relationship between both countries, and major commercial opportunities are considered. * * * discussed.

Ventana wishes to express its appreciation to the scores of Mexican leaders, both in and outside the government, who graciously contributed to this study through interviews, criticism and information. Ventana also wishes to gratefully acknowledge the assistance of Devres, Inc., which helped formulate and direct the study; Mr. John Koch, who wrote most of Chapters I and III; Dr. Jack Baranson, who wrote the automotive, steel and electronics sectoral studies; Dr. Harald B. Malmgren, who served as Chairman of the Advisory Committee and co-authored Chapter IV; and the members of the Advisory Committee: Dr. Alfred P. Stepan, III, Joseph H. Blatchford, Esquire, Mr. Gustavo Vega, Dr. Jorge Lawton Casals, Dr. Richard Feinberg and Mr. Jay Van Heuven.

CHAPTER ONE
INDUSTRIAL DEVELOPMENT PLANS OF MEXICO

I. BACKGROUND ON THE CONTEMPORARY MEXICAN ECONOMY

A. Current Ambitions

On April 15, 1980, Mexican leaders told their people that the country would grow by eight percent annually for the next 20 years, that their gross domestic product would quintuple by the year 2000, that per capita production would triple, and that they would achieve an industrial output surpassing that of Canada and many European nations. Within the next three years, Mexico was charted to undergo a ten percent annual growth in industry, a thirteen percent annual growth in capital goods production, and a 4.3 percent annual increase in agricultural output. By 1982 Mexico was to create 2.2 million jobs. At the same time, industry was to be restructured, decentralized, made more efficient, and encouraged to export.

Mexico's new petroleum resource was described as the "lever" which would enable the country to boost investments and output free of the traditional check imposed by balance of payments constraints. At the same time, however, efforts were to be made to avoid "petrolizing" the economy. 1/

All of these prospects and promises were spelled out in Mexico's Global Development Plan, the summation of the entire planning process of the Lopez Portillo Presidency. The Plan is the most comprehensive ever offered on the North American continent, the summation not only of economic plans, but of the political philosophy of a major developing country. Examining this plan and its predecessors, the history of planning and of events leading up to it, and evaluating its initial impact is the purpose of this first section of the study.

The Global Plan is a composite of many sectoral plans involving production, services, investments, and national purpose. The Spanish word "global" means comprehensive, all-embracing, and encyclopaedic, without suggesting -- as it does in English -- extension beyond national boundaries. The Global Plan addresses Mexico's problems across a broad spectrum. In addition to supplying sectoral forecasts, strategies, and goals, it presents an overriding national ideology which touches on all matters of domestic and foreign policy. The Plan articulates Mexico's vision of itself and the world in a time of rapid change.

The Plan bears the personal imprint of Mexican President Jose Lopez Portillo and the group of ministers and advisors who, with him have ushered in an era of planning since taking office in 1976. Lopez Portillo, who never held an elective office before being chosen as official Party candidate by his predecessor, Luis Echeverria, is perhaps the technocrat-politician prototype of Mexican leadership of the future. It could have been expected that his administration would put emphasis on planning and coordination while minimizing politicization and rhetoric. But the plans presented during the current regime have an important legitimization as well as a merely economic function. The plans go hand in hand with a series of constitutional, political and administrative reforms which Lopez Portillo hopes to leave to the nation. Whether these measures serve as a base for another Japanese miracle or a chimera remains to be seen. We must examine many features of Mexican political economy in an historical and contemporary light.

B. A History of Growth

Mexico's experience with rapid economic growth is already extensive and has passed through several distinct phases. Since 1940 Mexico has averaged a 6.1 percent rate of expansion in Gross Domestic Product (GDP). Much of the base for this growth can be attributed to a large national territory, rich in natural and human resources. However, equal importance must be attached to the remarkable political stability which Mexico has experienced over the last half century.

Most of today's national institutions evolved between 1928 and 1933, a period dominated by Plutarco Elias Calles, and between 1934 and 1940, under the presidency of Lazaro Cardenas. The institutions created during that era contributed to a period of unprecedented, peaceful succession in office; a stable if not always peaceful, countryside; and a pattern of worker-management relations which maintained growth in the cities. These institutions have shown signs of strain over time, but successive presidents, utilizing the official PRI party, have been able to implement reforms to ward off most major threats. Powerful executive rule provided an important base for Mexico's political stability and economic development. 2/

C. The Chief Economic Phases

From 1940 to 1954, Mexico experienced rapid growth, moderate inflation, and rapid conversion from a largely rural agricultural nation to an urban industrial one. The initial boost was supplied by high wartime demand for agricultural commodities and mining output. Investment increased by 9.9 percent per year (see Table 1), as the private sector responded to the opportunities of the urban market and the public sector accelerated infrastructural projects.

In 1954, the post-Korea slump hit Mexico, forcing a devaluation of the peso and major policy readjustments. In the aftermath, policy-makers focused heavily on price stability and the balance of payments. The currency was pegged at 12.5 pesos to the dollar and made freely convertible in order to encourage maximum capital inflow from the United States. Many of today's trade and migration patterns crystallized at this time. Since that period, for example, Mexico has continued to conduct two-thirds of its foreign trade with the United States. Sugar, cotton, and vegetable exports were sufficient to purchase needed quantities of machinery, tools, and other industrial inputs. Corn, wheat, and beans became net export commodities for Mexico as "green revolution" strains resulted in large increases in output from the modern agricultural sector. Mexico also became an important host for direct United States investments.

Bracero guest worker programs were undertaken at the invitation of the United States to relieve the demand for unskilled labor in the Southwest. In times of recession, however, the invitation was cancelled. In 1954, "operation wetback" resulted in the expulsion of hundreds of thousands of migrant laborers. 5/

From the late 1950's until 1970, Mexico experienced continued growth, low inflation, and continued emphasis on import substitution and industrial expansion. Finance Minister Ortiz Mena, whose tenure coincided with this period, labeled the country's model as one of desarrollo estabilizador (stabilizing development). Under this model, private investment was the principle source of development, while the state assumed a rector position in controlling basic resources, building infrastructures, and breaking bottlenecks. GDP expanded by an average 6.8 percent per year and inflation averaged an amazingly low 4.2 percent. This pattern gave rise to talk of a "Mexican miracle" and fed a heady optimism well in advance of the

TABLE I

Average Annual Rates of Growth
in GDP and Investment,
and Changes in Wholesale Prices

<u>Average %</u>	<u>1940- 1954</u>	<u>1955- 1970</u>	<u>1971- 1979</u>
growth GDP	6.0	6.8	5.4
growth I	9.9	8.4	6.7
change in wholesale prices	10.6	4.2	17.0

Source: Banco de Mexico 3/

TABLE II

Breakdown in Public Investment by Sector
(Percent Participation)

	<u>1960</u>	<u>1970</u>	<u>1975</u>	<u>1979</u>
Agriculture	6.9	13.4	19.9	16.2
Industry (petroleum)	31.2 (12.5)	38.0 (18.6)	36.7 (12.8)	43.5 (22.1)
Communication & Transport	36.0	19.9	21.3	13.7
Health, Education, Housing	22.5	27.1	20.3	19.8
Administration, Defense	2.3	1.6	2.6	3.1

Source: Banco de Mexico 4/

TABLE III

Gross Domestic Product in U.S. Dollars

GDP, 1979= \$121.306 billion

per capita GDP, 1979= \$1,785

Economic Structure, GDP
(Percent Participation)

	<u>1960</u>	<u>1970</u>	<u>1979</u>
I. <u>Sectors</u>			
Agriculture	15.9	11.6	8.7
Industry	29.2	34.5	38.8
Services	54.9	53.9	52.5
II. A. <u>Consumption</u>	82.5	80.3	73.8
Private	76.2	72.5	62.3
Public	6.3	7.8	11.5
B. <u>Investment</u>	16.9	22.4	27.9
Private	11.4	14.1	14.3
Public	5.6	8.3	13.6
C. <u>Inventories</u>	2.8	-2.7	-2.7
D. <u>Foreign Trade</u>			
Imports	12.6	11.6	14.1
Exports	10.4	8.9	12.4
100 = A+B+C+X-I	100.0	100.0	100.0

Source: Banco de Mexico 6/

current wave. 7/

Mexico's third contemporary development phase coincides with the administration of President Luis Echeverria (1970-76). During this period, the growth rate dropped to 5.4 percent and inflation swelled to 17 percent. The country was troubled by social disturbances, a mounting foreign debt, and loss of confidence. Blame is often attached to Echeverrias' style of rule, but it is much more accurate to see post-1970 difficulties as the outgrowth of the past. Despite positive indicators on the surface, Mexico's system of protecting domestic industry, its expanding population and weaknesses in the agricultural sector left it vulnerable domestically and internationally.

Mexico in 1970 was a very unequal country with serious structural barriers to progress. On the one hand, the poorest 40 percent of the population (corresponding roughly to the rural labor force) generated scarcely 11 percent of national income. On the other hand, the upper 10 percent of the population generated 41.5 percent of national income. 8/ Inequalities were acute within the rural sector itself. Seventy-eight percent of the farm units were unable to feed their own inhabitants, while 13 percent of the farm units, which generated three quarters of all production, provided jobs to only 20 percent of the rural laborers. 9/ The urban industrial plant was overprotected, inefficient, and generated monopoly profits, further aggravating the distribution of wealth. Industrial markets remained too small to permit high levels of production and inefficiency resulted.

These circumstances left Mexico highly vulnerable to tremors on the international front. Stagnation in agricultural output drove Mexico to import increasing quantities of grain at a time of rising world prices. The failure to diversify exports and markets, due to weaknesses in the industrial structure, led to unreliable export income. In addition, Mexico was hard hit by recessions in the industrial countries. Beginning with the breakdown of the world monetary system in 1971 and continuing with the oil embargo of 1973 and the recession of 1975, Mexico experienced balance of payments pressures which could only be overcome by increasing the foreign debt.

Echeverria tried to counteract some of these imbalances by increasing public investments in agriculture from 13.4 percent of public investments in 1970 to 19.1 percent in 1975. However, this proved to be

scarcely enough to counteract the continued flight of private capital from that sector. All in all, in the prevailing environment of tension and mistrust, the rates of return on public investments (more than 50 percent of the total in 1975) proved to be disappointingly low. When continued balance of payments problems required an 80 percent devaluation of the peso in 1976, an economic crisis developed in Mexico. Bank deposits dropped as investors shifted to dollars, and the rate of growth in GDP fell to 2.1 percent, well below the 3.5 percent population increase.

D. The Lopez Portillo Administration

When Jose Lopez Portillo was inaugurated President on December 1, 1976, his first task was to restore confidence in the Mexican economy. He espoused an "Alliance for Production," whereby entrepreneurs would agree to invest and workers would agree to moderate wage demands in order to get the economy in motion and inflation under control. At the same time the President made public the magnitude of recent oil discoveries which brought a surge in confidence among investors both at home and abroad. 10/

Oil alone, however, could not define Mexico's future course, the President concluded. The experiences of Venezuela, or worse, Iran, suggested to him that oil wealth posed a number of important problems. Although petroleum exports might relieve the balance of payments plight, they also afforded the temptation to base all prosperity on oil and delay reforms and advancement in other industries, in agriculture and in social services. The fact that most oil exporting nations are weak in agriculture was considered an important problem that Mexico wanted to avoid.

It was within this framework that the President, in 1976, spoke of "a new plan for Mexico." Without providing details or setting deadlines, Lopez Portillo spoke of the need to plan expansion of public sector enterprises and to coordinate public and private growth. Four years later his Administration had issued a score of sectoral and economy-wide plans dealing with every facet of the society. In doing so the President was expanding and bringing a new professionalism to an important Mexican institution: the Plan as an instrument of national unity. It is important to examine history to understand the role of planning as both a practical and a symbolic means of maintaining and expanding consensus.

II. THE HISTORY OF MEXICAN PLANNING

A. Plans as an Instrument of National Unity

Certainly plans, if not planning, have had a long history in Mexico. Independence precursor Friar Melchor de Talamantes drew up a "Plan of Independence" in 1808 to summon support for freedom from the Spanish colonial rule. 11/ After the armed struggle broke out two years later, Mexico's Founding Fathers issued plans that included their grievances and goals. Throughout the turbulent 19th century, numerous rebellions and revolts were accompanied by plans created by military chieftains, intellectuals, and organized groups. Finally, when Francisco Madero launched his revolt against the dictatorship of Porfirio Diaz in 1910, it was under the banner of the Plan of San Luis Potosi, calling for effective suffrage and no re-election. Thus began the political movement which in time gave birth to the contemporary Mexican State.

B. Planning and the Economy

The present day Mexican State and its concern for economic planning evolved in this century. Prior to the Revolution, the regime of Porfirio Diaz was guided by largely laissez-faire notions of the role of the State in the economy. All agricultural and mining enterprises were the domain of private and foreign capital. The government stepped in directly to promote railroad construction and, after 1900, irrigation works, but the remainder of State intervention was limited to licensing and taxing. Extensive territorial and subsoil rights were signed over to large-scale private and foreign interests on extremely easy terms as an incentive to exploitation, but this policy subsequently proved to be a source of resentment to Mexico's middle and lower classes. 12/

Following the Revolution, the Constitution of 1917 extended State control over natural resources and strengthened its role in the economy. Slow reconstruction took place during the 1920's, but most progress was made on social and political grounds. During the depression, a generation of leaders became hopeful that State planning offered an alternative to discredited Western Capitalism. In 1934, the Official Party (later to be called the PRI) presented the first Six Year Plan of Government. It pronounced assorted broad

ideals and goals; however, the absence of sufficient data, administrative skills, and revenue made its execution all but impossible. Only some of the goals for irrigation were realized. 13/ The 1934-40 government of Lazaro Cardenas made the greatest strides in popular organization and the redistribution of wealth. Other noteworthy achievements included the establishment of bureaus devoted to the collection of data, and the creation of Nacional Financiera, a state body designed to promote the financing of key public works and industrial projects. 14/

Another Six Year Plan was presented in 1940, at the beginning of the Avila Camacho administration. Again it served primarily an ideological and legitimizing function. Mexico's great surge in industrial output at the time was the result of the high demand and prices for its exports caused by the World War. However, the increasing complexity and sustained growth of the economy required new levels of supervision and coordination. The Ministries of Finance, Economy and Patrimony (public property and natural resources) assumed new responsibilities. The Bank of Mexico (created in 1925) established incentives and portfolio requirements to encourage private banks to invest in priority and bottleneck areas. The Bank also established an important office of research and planning.

Global national planning went out of style temporarily in the 1950's. But regional plans for flood control, settlement, and agricultural promotion continued to receive attention. Another stimulus to formalized planning came from the IBRD, which encouraged the preparation of detailed proposals and cost-benefit analyses by nations wishing to contract loans. During the Ruiz Cortines administration (1952-58), planning received impetus through the formation of an Investment Commission staffed by key representatives from the Departments of Finance and Patrimony and the Bank of Mexico. It set priorities, coordinated projects, and supervised expenditures.

Inter-ministerial jealousy and parochialism have been traditional barriers to cooperation. To combat this, a special Ministry of the Presidency was created in 1958 to centralize budget supervision and promote sectoral balance. However, this entity faced numerous problems. The Ministry saw itself bypassed by other ministries taking their pleas directly to the President. When Lopez Mateos prepared the Plan for Immediate Action in 1962, he chose to rely on an inter-ministerial commission rather than on the handicapped

Ministry of the Presidency. ^{15/} Although the Presidency came to exercise increasing authority throughout the 1960s and early 1970s, the weaknesses it suffered were not fully overcome until the administrative reform of 1976.

C. The Legacy of History for the Mexican Economy and Planning Today

The plans of earlier eras served a function which remains relevant to plans and planning in Mexico today. First, they were intended to give concrete expression to a set of goals and objectives. Second, they served as tools to forge unity within the government and among competitive leaders. Finally, they became legitimizing symbols vital in winning the support of influential sectors of the society. All plans in the present period, even those nominally devoted to economic, social, or political goals, echo the ideas and principles of earlier documents. Mexico's government endeavors to encourage popular approval of its policies by presenting them in highly embellished plans which reiterate the nationalist and neo-liberal ideals and symbols flowing from the eras of Independence and the Revolution. ^{16/}

Economic planning is likewise heavily influenced by history, particularly the results of the Revolution. To be sure, the Mexican economy is fundamentally a market economy which recognizes the role of private property. Decision-making is, therefore, decentralized and responds to the forces of supply and demand. However, the private market is strongly influenced by a large State apparatus which controls many key sector positions. Mexican leaders prefer to call their economy "mixed." The State not only controls fiscal and monetary policy, but dominates or enjoys exclusive control in such sectors as mining, energy, transportation, and the refining, processing, and marketing of many basic commodities. Strong state participation in so many sectors makes at least some level of planning and coordination a necessity.

Planning in Mexico is also facilitated by six decades of post-revolutionary stability. Nowhere else in Latin America have so many generations of leaders been able to guide development along so continuous a course.

The Revolution yielded results which specifically influenced the State's ability and necessity to plan. The Constitution of 1917 gave the State control over water and non-renewable resources. It also allowed the State to abrogate the right of private property when it clashed with social need. Thus the State eventually saw fit to nationalize the petroleum and irrigation sectors. The State also became the chief arbiter and owner in the mining sector. It was empowered to carry out extensive land reform, nationalize certain manufacturing industries, and institute profit sharing programs. As a result, government involvement in the economy was greatly expanded.

Second, the Revolution brought a split between Mexico's political and entrepreneurial leadership. The nature of the private/public sector rivalry remains disputed, but after 1910 the two were divided into competing, jealous spheres. Today Mexico's bureaucratic and business elites are educated separately, associate independently, and, according to historian Peter Smith, have a low opinion of one another. ^{17/} Established organizations and bodies have laid out an etiquette of language for ironing out public-private differences, but open disputes erupt from time to time. Business confidence has been generally high during the Lopez Portillo administration.

The modern Mexican State is dominated by the official PRI party (the Revolutionary Institutional Party). The ideals, slogans, and myths extending from the revolution are used by the party in maintaining public support for the government. Labor, peasants, professionals, and white collar employees are bound into popular organizations which are active at election time, and they help legitimize the PRI ruling mandate and leadership renewal. Dissatisfaction has increased in recent years, but no outside power has yet been able to challenge the PRI-State monopoly.

The private sector, on the other hand, has not doctrine or means by which to win substantial public support. Its sheer material power does not enable it to dictate terms to the State on major issues. However, private interests can put up a struggle when threatened. The official business organizations (CONCANACO, CANACINTRA, etc.) are subject to restrictive State supervision, but businessmen have recourse

to numerous channels of influence.

The economic result of this situation is that, in Mexico, the State establishes the general goals to be achieved. It undertakes the works of infrastructure and sets up the incentives necessary for private investment. The private sector is then expected to respond in reasonable accordance with the pattern indicated by the State. This situation has been characterized as an "Alliance for Profits." The State is jealous of its supremacy in certain spheres, but relies on the proper response from the private sector to complete its development strategy. 19/

III. PLANNING TODAY AND THE PROBLEMS AFFECTING IT

A. The Planning Apparatus Today

Lopez Portillo began his six year term by replacing the Ministry of the Presidency with the Ministry of Programming and Budget (SPP), with expanded supervisory and administrative responsibilities. Its two major functions are, first, to prepare the annual budget in cooperation with planners in the other ministries, and second, to oversee the expenditures not only of those ministries, but also of the decentralized agencies and semi-public enterprises (of which there are more than 450). The SPP may be regarded as the key piece in the central planning cluster. Other pieces in this cluster include the following:

1. The Ministry of Finance. This ministry performs the all-important function of collecting the revenues needed to pay for the expenditures authorized by the SPP. Tax collection is a weak point in most developing countries, and Mexico is no exception. Collections seldom keep up with expenditures, which thereby contribute to inflation. During the recession years of 1975 and 1976, the federal deficit equalled 9.3 and 7.4 percent of the GDP, respectively. 20/ But, as so many world governments have found during the 1970's, it is politically more expedient to accept inflation than the heavy unemployment which is the result of fiscal cutbacks. Mexico has been unable to implement truly extensive fiscal reforms in favor of greater reliance on pro-

gressive income taxes. In their absence, the country has settled for the introduction of partial measures and a ten percent, value-added tax (January, 1980), a kind of national sales tax with all its regressive features.

2. The Bank of Mexico. Mexico's Central Bank exercises a powerful role in general credit expansion and in private lending policies. Through a system of mandatory deposits, the Bank can control credit expansion. Loans to private banks are contingent upon investment patterns corresponding to national priorities. Although the Bank oversees foreign exchange policy, Mexico has avoided the type of controls common to most developing countries. Free convertability has been the mainstay. But the policy of pegging the peso to the dollar has required, in the light of differential inflation rates, considerable intervention to support the peso.

3. Nacional Financiera. This body was created in the 1930's to promote the private equities market, but has since become mainly a development bank used by the government to finance infrastructural works and priority industries. It channels both public sector savings and loans from abroad. Under the aegis of Nafinsa, as it is called, a large number of government trust funds (FOGAIN, FOMIN, etc.), have been established, each used to fund joint projects with different industries. A number of conditions must be agreed to when a private entrepreneur accepts a partnership with Nafinsa; but, despite occasional complaints, the private sector finds the relationship profitable. In addition, private bankers tend to consider the trust funds "complementary" to their function, rather than competitive.

4. Ministry of Patrimony and Industrial Promotion (SEPAFIN). This ministry controls national mineral resources, other state property, and the plant and equipment of public sector industries. It is also responsible for coordinating industrial policy, investments, the development and utilization of energy resources, and the planning of new industrial centers. The chief project of SEPAFIN under the current administration has been the National Industrial Development Plan (NIDP).

The other ministries are outside this center cluster. Those most immediately connected with investments

and policies affecting the economy include Commerce, Agriculture, and Transport and Communications. Great importance must also be attached to the investment programs of such semi-autonomous bodies and enterprises as the Federal Electricity Commission (CFE), SIDERMEX (steel), and FERTIMEX (fertilizers). Obviously, with petroleum and petrochemical development playing a key role in the current picture, the PEMEX budget must be carefully developed to accommodate its own and other national needs. PEMEX revenues and expenditures will obviously deserve careful scrutiny in the years to come, since petroleum will be a key financial base for Mexico's growth. Also important are the Presidential advisors, a small group of able, well-trained, generally younger people who influence policy in the manner of White House assistants but with less visibility and more scholarship.

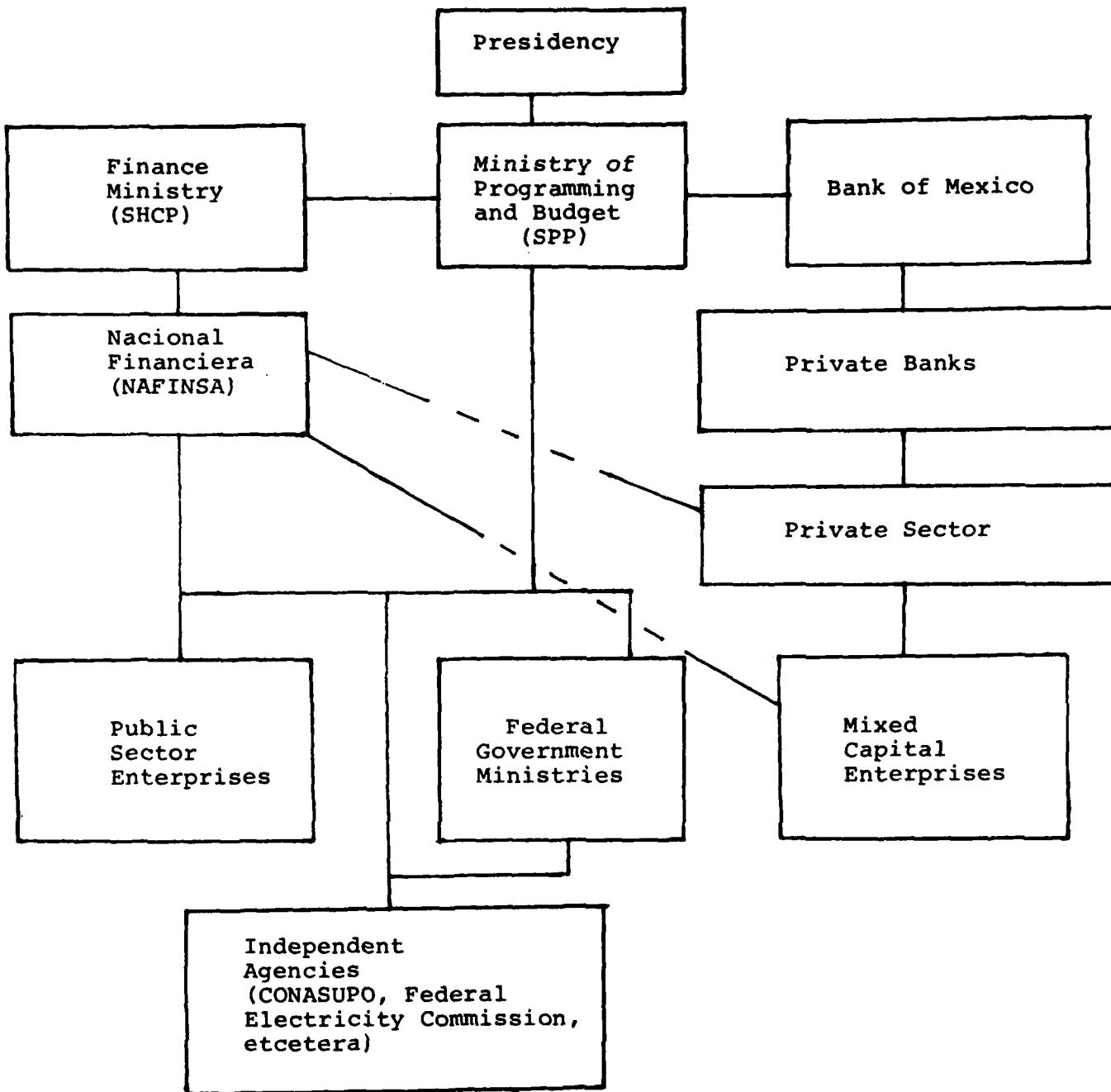
The Mexican government has other important agencies central to the global planning scheme. CONASUPO (National Popular Substances Company), the massive official marketing agency, governs the pricing, distribution, and subsidized sale of many basic consumer items over a wide area of the country. It also oversees the importation of grains -- an increasingly serious matter in the face of growing food deficits.

Mexican planning is best described as the attempt to set up broad indicative guidelines that will complement each other in achieving sectoral and general goals. One writer has called it a pattern of "mutual adjustment" by which government agencies and departments, along with the private sector, reach accommodations with one another concerning the immediate and long-term direction of economic life. ^{21/} Leaders ostensibly aim for reasonable goals. When these goals prove not to be reasonable, considerable flexibility and pragmatism is allowed. As current Planning and Budget Minister Miguel de la Madrid Hurtado said in presenting the 1980-82 Global Plan, "The Plan is not a map finished to precision that will carry us mechanically to the objectives, nor is it a catalogue of responses to all possible questions. Neither is it a panacea." ^{22/} Mexican economist Miguel Wionczek has labeled the approach "incomplete formal planning." ^{23/}

B. Factors Affecting Plan Lifespans and Outcomes

A number of general factors impinge upon the ability of any developing country to plan. First, there is the question of adequate statistics. As mentioned earlier, Mexico's earliest attempts to plan

FIGURE I
MEXICO'S PLANNING STRUCTURE



were impeded greatly by a lack of production, geological, hydrological, and financial figures. Many decisions had to be ad hoc and were politically motivated. Data has improved over the years and, although discrepancies continue to exist, figures published by the Bank of Mexico and the SPP are generally used with confidence.

World economic cycles have been considered another obstacle to planning in developing countries. Since most of them depend on the export of primary commodities in order to finance the purchase of crucial capital inputs, the erratic nature of these markets shortens the time horizon of planners. 24/ Mexico is no exception. A fairly diversified export structure has not shielded Mexico from tremors from the north. As mentioned above, breakdown of the international monetary system in 1971 and the 1974-76 recession in the industrialized nations widened balance of payments deficits during the Echeverria administration. High growth rates (a prime requirement in a country where job creation scarcely keeps pace with entries to the labor market even in the best of years) were maintained only at the expense of soaring inflation and external indebtedness. The resulting pressures of the peso required the aforesaid 55 percent devaluation of 1976.

Climatic conditions also interrupt many plans. Much of Mexico's primary staples are produced on marginally rain-fed lands. A drop in the normally scanty annual rain levels over the last 12 years has aggravated an already serious decline in marginal returns.

Other caveats with regard to planning pertain more specifically to the type of regime under which Mexico operates. The six year length of each presidential administration is generally the maximum lifespan any plan can expect. Although the PRI retains power, high turnover in the executive ranks causes an almost complete shift in personalities and loyalties from one administration to the next. Peter H. Smith has measured a 65 percent average change among high administration officials every six years for the past four decades. 25/ The unfortunate result is that many projects are abandoned prior to completion. Successors feel little obligation to finish work begun by their predecessors. Examples abound on the municipal level. Priority public works on the national level usually receive a better fate, but major shifts in appropriations are common in conjunction with the arrival of new faces to the ministerial suites. 26/

One result of this cycle is that leaders are compelled to concentrate on highly-visible, quickly-

finished projects (roads, dams, housing units, etc.). Less attention is given to efforts which must be coordinated over a long time frame. 27/ In addition, since appointees must continually worry about where they will end up in the next reshuffle, they must give attention to political chiefs and power groups, to the detriment of a rational conduct of policy. Plans are liable to suffer distortion once the implementation stage is reached -- especially if redistributional goals are involved. 28/ Furthermore, the Mexican bureaucracy is plagued with various endemic ailments: personalism, corruption, low horizontal cooperativeness, and almost total insulation from the public. Any new set of goals spelled out on a flow chart can be warped beyond recognition in practice. The executive must be prepared to intervene from above if important changes are to be introduced. 29/

Mexico's planning and administrative apparatus is not alone in displaying these defects. Moreover, the technical expertise and professionalism in many Mexican sectors compares favorably with any developing country. High turnover at least reduces the bureaucratic inertia associated with the "permanent government," known to exist in most other countries.

IV. THE PLANS AND THEIR ANATOMY

A. The Genesis of the 1980-1982 Global Plan

1. Motivation

In 1975, elder statesman Jesus Reyes Heroles, then Secretary General of the official PRI party, tried to prepare a "Six Year Plan of Government, 1976-1982," inspired by the plan of the Cardenas years in the 1930's. It was proposed that the cast of presidential hopefuls make "public comments" on the proper scope and goals of this Plan. Perhaps this move served a two edge function: one, to promote a continuity of policies from one administration to the next; and two, to hand-tie the successor to then-President Echeverria with a set of obligations which he could not easily shake. But Echeverria announced his chosen successor sooner than expected. Thus the text of Reyes Heroles' Plan remained little more than a scrap of paper. However, the crisis of confidence surrounding the events of 1976 -- the recession, the devaluation,

the flight of capital, land seizures, and a flock of rumors -- required that candidate Lopez Portillo conceive a similar all-encompassing strategy to restore faith. He spoke out for the need to gain control of events and provide guidance to the nation by means of planning.

Upon his inauguration, Lopez Portillo announced an "Alliance for Production" which would reunite government, business, and popular sectors behind the development task.^{30/} In his first annual address on September 1, 1977, he spelled out the three steps of his administration's economic strategy. The first two years would concentrate on "recovery," followed by a two year span of "consolidation," and finally, a period of rapid, sustained growth which, as policy papers repeatedly stressed, meant "a development policy which takes advantage of petroleum, not a petroleum-based development policy."^{31/} Nevertheless, it was obvious to all what a big role the publicity given to recently discovered oil reserves had in restoring domestic and international confidence.

2. The Plans' Emergence

Mexico's Global Development Plan is the supreme expression of the principles and guidelines behind the government's economic and social policies, which became public only after a long inductive process involving the elaboration of many specific and more general sectoral plans. Three of the most important are the National Industrial Development Plan (NIDP), the Urban Development Plan, and the Mexican Food System (SAM). Here we will discuss how and why they came into existence, and we will point out some of the conflicts that emerged in the preparation of the final Global Plan.

Lopez Portillo made clear during his campaign for office that comprehensive planning would be a major goal of his administration. Carlos Tello, previously a collaborator of Lopez Portillo in the Finance Ministry under Echeverria, was placed in charge of a special team created to prepare a Program for Public Sector Action, from 1977 to 1982. Upon assuming office, Lopez Portillo named Tello as Minister of Programming and Budget (SPP). During the course of 1977, a number of sectoral plans were prepared, including the Plan for Education. But a number of important conflicts occurred in the central process. Specifically, the Ministers of SPP and Finance, Carlos Tello and Rodolfo Moctezuma, found themselves at loggerheads over the

size of the 1978 public sector budget. Moctezuma, reflecting concern for price stability, proposed a \$34 billion total public sector slice. Tello, on the other hand, stressed the need for rapid expansion, calling for a government and public enterprise expenditure of \$42 billion. Lopez Portillo asked both men for their resignations. Their successors, Garcia Sainz at SPP and David Ibarra at Finance, agreed on a budget close to that originally proposed by Tello, ^{32/} but the bridge to the Global Plan of 1980 was still far from complete.

B. The Urban Development Plan

In early 1978, the Ministry of Urban Development and Human Settlement published a multi-volume Urban Development Plan. The goal of this plan was to encourage a decentralized and more balanced city growth. The Federal District (Mexico City and environs) which currently harbors 20 percent of the national population and generates 50 percent of GDP, is caught in a runaway expansion. Many authorities project a metropolitan population of almost 30 million by the year 2000. The plan analyzes the implications of this alarming prospect and issues some policy guidelines to help channel some of the anticipated urbanization elsewhere. Although many guidelines were announced, they were by and large, general, diffuse, and non-binding. As Calvin Blair notes, "One must conclude that the purposes of the Urban Development Plan, at this stage, are largely exploratory, educational, and oratory." ^{33/} It did, however, set a course for what followed.

C. The National Industrial Development Plan (NIDP)

1. General Goals

In 1979 the government unveiled its National Industrial Development Plan (NIDP). This ambitious plan, written by the Minister of Patrimony and Industrial Promotion (SEPAFIN), Jose Andres Oteyza, his Subsecretary for Industry, Dr. Natan Warman, and other leaders of the ministry, spells out the broad goals of increasing food processing and manufacturing capital goods and manufacture of consumer nondurables. The Plan also sets the policies regarding employment incentives and incentives for decentralization and the development of new commercial centers and ports. Like all of Mexico's plans, its terminus, 1982, coincides

with the end of the presidency of Jose Lopez Portillo, although it does make longer-range projections. It is based on an econometric model and includes recommended levels for both public and private investments.

2. Incentives Offered

The NIDP establishes a very important set of fiscal incentives to industrial expansion. These incentives have several chief goals:

1. to promote the food processing industry,
2. to promote the domestic capital goods industry,
3. to encourage regional development while at the same time slowing growth of the Federal District,
4. to assist small enterprises as agents of employment generation and improved income distribution,
5. to stimulate the use of abundant energy sources in key areas,
6. to increase employment.

Food processing already accounts for over 40 percent of Mexico's manufactured output, but the government assigns first priority to that sector in anticipation of great increases in demand. Second priority goes to the capital goods industry. Within this sector, preference goes to the manufacturers of food processing equipment and next, to machine and tool suppliers to a variety of basic and heavy industries: petrochemicals, electrical generation, mining and metallurgy, construction, and transport vehicles and equipment. Other consumer non-durable goods industries receive a "category two" priority. This is intended to answer the surge in demand for textiles, paper, detergents, pharmaceuticals, and plastics that will surely come with the rapid rise in per capita income.

3. Regional Priorities

To encourage decentralization and regional development, the NIDP has established several zones which will receive different degrees of incentives.

Category I: Priority

- A. Major new port areas: Tampico,

Coatzacoalcos (Gulf Coast), Salina Cruz,
Lazaro Cardenas (Pacific Coast).

B. A select group of 99 cities in the north, west, and southeast of the country judged to present conditions for accelerated industrial development.

Category II: Other provincial cities and sites chosen by agreement between federal authorities and local governors.

Category III: Areas of "controlled" or "regulated" development.

A. Areas of controlled growth (which have been defined to include only the Federal District) receive only 5 percent incentive for purchase of domestic machinery.

B. Areas of Consolidation (zones around the Federal District whose receipt of incentives will be conditional on the positive regional contribution an industry makes).

Since the NIDP steers regional incentives away from the Mexico City area, it offers some teeth to the general recommendations spelled out by the National Urban Development Plan. However, Guadalajara and Monterrey -- Mexico's second and third largest cities -- were not included in Zone III. This leaves them eligible for incentives under a Zone II designation at the discretion of federal authorities and state governors. The governors are expected to play an important role in the designation of these zones.

Small industries are also offered incentives under the auspices of the NIDP. For the plan's purposes, a small enterprise is defined as one whose fixed assets total less than two hundred times the legal minimum wage in the Federal District (\$439 thousand at recent exchange rates). ^{34/} Support of small firms is considered desirable because of their high employment elasticity and ability to locate in smaller cities, and because they help redress the oligopolistic structure prevalent in many of Mexico's industries.

4. The CEPROFIS and How They Work

The incentives offered for development of priority industries, decentralization, and the expansion of small firms is offered through a system of Tax Promotion Certificates called CEPROFIS. Any firm making an

investment which it feels qualifies for incentives under the NIDP can apply to the Finance Ministry for a certificate. This certificate will have a value of between 5 and 25 percent of the fixed assets value of the investment, depending on the incentive for which the firm qualifies (see Table IV). The certificate can be used as a credit towards any tax or combination of taxes which the firm is assessed for the five years after it is granted. However, for depreciation purposes, the firm must also subtract the value of the certificate from the fixed assets value of the investment. ^{35/} This does not, however, cancel the magnitude of the incentives offered.

The plan projects that over 60 percent of private sector investments made between 1979 and 1982 will qualify for incentives under the program. Calvin Blair, presuming that the average level of incentives will equal about 15 percent of the value of fixed assets, calculates that the gross value of the certificates could equal four tenths of one percent of the GDP over the three years of the plan's duration. ^{36/}

As indicated by Table IV, a firm qualifies for certificates of varying magnitudes, depending on what sector it invests in, what zone it chooses for the expansion or addition of plant and facilities, and whether the enterprise classifies as a small firm. To qualify, the firm need only be a Mexican national corporation (which includes joint ventures with non-Mexican companies) and indicate that the facilities will expand productive capacity by 40 percent or more. An additional certificate equal to 5 percent of fixed assets is available to both national and foreign firms for the purchase of domestically produced capital goods.

Ostensibly to encourage employment, but also to counteract the tendency created by the plan itself to utilize capital at the expense of labor, a special incentive is offered for job creation. Any addition of work shifts or the creation of new jobs will be awarded a credit for two years equal to 20 percent of the Federal District minimum wage times the number of new man hours.

To understand how the system works, we consider a number of hypothetical cases.

A. A small enterprise locates in a priority I(A) port area and buys capital goods which are made in Mexico. It will receive the 25 percent credit accruing to small firms plus the 5

percent credit for domestic capital goods purchases, but will not simultaneously receive a regional priority credit or an employment credit (i.e., there is a maximum and no "double dipping").

B. The same enterprise locates in the same zone, but applies to the Finance Ministry as a maker of "category two" consumer nondurable goods. It will receive the 15 percent credit accruing to that category of industry in an I(A) Zone. It will also qualify for the 5 percent credit on domestic capital goods purchases, and in this case, for the 20 percent employment credit (which translates generally into about 5 percent of fixed assets value). However, in this case it will not qualify for the 25 percent small business credit.

C. A large, non-priority industry locates in Mexico City intends to expand and generate 300 jobs. If it purchases domestically made tools and equipment, it will receive a credit equal to five percent of the value of those purchases, but it will qualify for no other incentives. If the same firm locates outside of Mexico City, then it would be eligible to apply for the employment credit.

The maximum credit for which any firm can qualify is equal to 30 percent of the value of fixed assets, as described in case "A." Most firms qualify for less than that amount and, as suggested by Table IV, many combinations are possible.

5. Energy Incentives Offered by the NIDP

The Industrial Plan also offers energy incentives to petrochemical industries, to those companies invest in Zones I and II, and to companies which locate along the national gas pipeline network. The standard price of gas in Mexico is currently \$0.32 per thousand cubic feet, compared to \$4.94 at the border for sale to the United States. Any new industry locating in a Zone I(A) port, for example, is eligible for a 30 percent reduction on its gas costs as well as the cost of fuel oil or electricity. Likewise, a petrochemical firm locating there will receive a 30 percent discount on basic petrochemical inputs, provided it exports at least 25 percent of its output for at least three years. A firm locating along the national gas pipeline will receive a 15 percent subsidy on inputs of that fuel. A firm which locates in one of the "preferred"

Table IV

Mexico: Tax Credit¹ for Industry 36/

Geographic Location of Investment	Small Enterprises ²	Sectoral Priorities			All Industrial Activities		
		Priority Activities Category 1	Priority Activities Category 2	Non-Priority Activities	Purchase of Machinery and Equipment Made in Mexico	Created by Additional Work Shifts	
Zone I: Preferential Stimulus	25% (Inv.)	20% (Inv.)	15% (Inv.)	None	5%	20% (Emp.)	
Zone II: State Priorities	25% (Inv.)	20% (Inv.)	10% (Inv.)	None	5%	20% (Emp.)	
Rest of Country	25% (Inv.) ³	20% (Inv.)	10% (Inv.) ³	None	5%	20% (Emp.)	
Zone III: Ordering							
A. Controlled Growth	None	None	None	None	5%	None	
B. Consolidation	25% (Inv.) ³	20% (Inv.) ³	10% (Inv.) ³	None	5%	20% (Emp.)	
		20% (Emp.) ³	20% (Emp.) ³				

Source: *El mercado de valores* (April 30, 1979), p. 352. Translation and minor adaptations were made by the author. Taken from *Plan nacional de desarrollo industrial, 1979-82*, p. 181.

Note: The percentage indicated is multiplied by the amount of additional investment (Inv.) in structures and in new machinery and equipment directly related to the productive process. The tax credit is granted at the time the investment expenditure is made. For employment (Emp.), the percentage shown is multiplied by the number of additional full-time-equivalent workers times the annual minimum wage for the economic zone in which the beneficiary firm is located; this credit is available for two years.

1. These tax credits take the place of exemptions currently in effect for several kinds of taxes—import duties, stamp tax, gross receipts tax, and business income tax—and of tax deductions such as accelerated depreciation. They may be used to pay any federal tax not dedicated by law to a specific purpose.

2. Firms with fixed assets no greater than 200 times the annual minimum wage for the Federal District (Mexico City).

3 Available only for expansion of capacity in existing lines of industrial output.
SOURCE: Blair, C., "Mexico: The New Planchart for Planning"

townships of Zone I(B) qualifies for a 30 percent subsidy on any two of the following inputs supplied by the State: gas, fuel oil, electricity, or petrochemicals. For firms locating in any town where gas is not available, a 10 percent fuel oil subsidy is offered. 37/

These energy subsidies are scheduled to expire on December 31, 1988, but, as Calvin Blair points out, "future decrees and accords can easily modify the periods or extend the deadlines." 38/ The energy incentives are primarily designed to stimulate expansion of the booming domestic market, but the policy of low energy prices is expected to encourage exports as well. In the words of the NIDP, "[low energy prices] strengthen the competitive capacity industry by awarding it a substantial margin of protection by means of inputs. In contrast to other forms of protection that tend to raise such costs, making access to foreign markets more difficult, this mechanism constitutes a direct impulse to exportation." 39/

6. Policy on Foreign Investments and Trade

Mexico has pursued a policy of "mexicanization" in recent years, under which foreign firms are required to enter the market in joint ventures with Mexican partners. The Foreign Investments Law of 1973 prohibits the participation of direct foreign investment in primary petrochemicals and certain other strategic industries reserved for the Mexican State. Foreign investors may enter with a 49 percent holding with Mexican partners in most other industrial sectors. In a few sectors, such as mining, foreign partners are limited to a 34 percent holding. The government also wants foreign investors to increase the proportion of domestic inputs used in their operations and to export as much as they import. The Automobile Decree, discussed in Chapter Two, is the prime example of this policy.

The original text of the NIDP stated that exports will be promoted, but spelled out no specific incentive policies. Mexico has offered subsidies and favorable credits to exporters for years. Today the Ministry of Commerce grants credits, called CEDIIs, against value-added and other indirect taxes called CEDIS to exporters. The value of the CEDI is based on several factors: the value-added to the product; the proportion of domestic inputs; and the rate at which the firm increases its exports of that product from one year to the next. The rate of reimbursement varies from 25 to 100 percent of the tax against which credit is applied. To qualify, a product must have at least 30 percent domestic input which authorizes it to receive a 25 percent reimbursement if it has a low

value-added (Category A) and a 55 percent CEDI reimbursement if it has a high value-added (Category D). If the proportion of domestic content is 80 percent or higher, the reimbursement for lowest and highest value-added exports is 50 and 80 percent, respectively. The table below displays the graduation in detail:

Percent National Content	Percent Reimbursement According to Value-Added Category			
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
30 to 39	25	35	45	55
40 to 49	30	40	50	60
50 to 59	35	45	55	65
60 to 69	40	50	60	70
70 to 79	45	55	65	75
80 and above	50	60	70	80

These CEDI reimbursements can be boosted even higher because if firms increase exports from one year to the next. A 5 to 10 percent increase earns a 10 percent reimbursement. A 10 to 15 percent export increase is rewarded with a 15 percent reimbursement. The reimbursement for increases of more than 15 percent is 20 percent. Thus, a firm which increases its exports of a product with more than 80 percent national content by more than 15 percent from one year to the next qualifies for a CEDI equal to 100 percent of its indirect tax obligations.

Decisions concerning the eligibility of different products for CEDIs have historically been made by the Ministry of Commerce with a great deal of discretion. Most export promotion decisions are made without drawing much public attention and may not even appear in the Federal Register.

During 1980 Mexico granted full indirect tax exemption on exports of fruit and vegetables. In December, 1980, the average value of CEDIs was quietly increased from 5.2 to 10 percent of product value. Also, the ministry has recently reduced the amount of discretion allowed its officials in fixing the value of reimbursements, using a published schedule to cover most transactions.

At the beginning of 1981 an important decision was made that links the regional and sectoral incentives program of the NIDP to export promotion. Any firm investing in a Zone IA port in a top priority industry (capital goods and food processing) is currently eligible for a CEPROFI (the credit for domestic

purposes) equal to 20 percent of fixed asset value. The new reform makes it possible for that firm to increase the value of that CEPROFI to 25 percent if 25 percent of production is earmarked for export or 30 percent if half of the output is to be exported. Another reform makes it possible for CEDIs (the export credit) to be received in advance. Exporters simply have to inform the Ministry of Commerce of their projected 1981 exports. Once half that amount is shipped, they can apply for advance payment of the rest of the CEDIs to which they are entitled. Thus the domestic and export credits are now linked and their value improved.

Other policies also encourage exports. Exporters can expect credit on more agreeable terms and more administrative cooperation when applying for investment and import licenses. These policies are not spelled out word for word in any plan, but are implicit by the priority established in favor of export promotion. In practice such favoritism proves to be very important in the Mexican context.

7. The Border Regions

Mexico's border regions are subject to legislation which predates the current development plans. Due to the special problems faced by the northernmost states and the border cities, neither the NIDP nor the Global Plan includes these areas in the package of incentives and policies applying to other zones of the country. However, given that the border has immense importance vis-a-vis the United States, it is valuable to examine its economic features and the development policies applied.

The northern states harbor about 17 percent of Mexico's population and have traditionally been among the more prosperous. However, the level of integration with the national economy has been low. The border towns, particularly, carry out more commerce and communication with the United States than with the rest of Mexico. Road and mass media links have been improved in recent years, but the ease of smuggling has frustrated the erection of protective trade barriers. Mexican shoppers and job seekers carry on busy intercourse with the "other side."

Commerce and services employ 46 percent of the local economically active population, compared to 32 percent in the nation at large in 1970. Of the 17 percent employed in industry, 30 percent work for in-bond affiliates of United States corporations which assemble imported components for textile and electron-

ic goods and then export the finished products back to the United States. These in-bond plants, or maquiladoras as they are known in Mexico, increased in number from 120 to more than 600 during the 1970's. In 1979 maquiladoras earned \$1.027 billion, equal to 6.2 percent of Mexico's current earnings that year.

Mexico's development policies for the border regions have several basic goals: to promote integration with the rest of the country, to promote the inflow of United States tourists and the purchases they make, to assist local merchants compete with United States sales outlets in the market for goods of United States origin, and to create jobs. Most of the present legislation dealing with border region development dates from the Echeverria administration (1970-1976). In 1971 a Public-Private Development Commission was created to oversee regional policies. In 1972 existing laws concerning the establishment and operation of in-bond industries were modified to approximately their present form. At the same time, a variety of tax, customs, and transportation concessions were granted to promote growth and to encourage the purchase of locally sold goods.

Today the government grants 10 year holidays on the value-added tax to firms establishing stores and shopping centers in the border vicinity, provided that the prices on the goods sold be competitive with those in the United States. A special list of "high appeal items" may be imported from the United States duty-free, again provided that they be sold competitively. Duty exonerations are also available for the importation of capital goods for local industries. Special trust funds exist to finance the creation and expansion of touristic and commercial enterprises. Discounts on rail and maritime rate ranging from 25 to 50 percent are used to encourage greater trade with the rest of Mexico. Finally, duty exemption is available on inputs for in-bond industries. 41/

Mexico avoids offering energy incentives to the border regions. Even so, present United States-Mexico price differentials with regard to gasoline, diesel, and fuel oil are great and cause significant smuggling problems. Some border municipalities report 50 percent increases in petroleum product consumption from one year to the next. Much of this obviously goes to the United States.

8. Tourism

Tourism is subject to its own sectoral plan independent of the NIDP but it is discussed here both because of its inherent importance and because of the parallels between its incentive program and that of the NIDP.

Mexico promotes tourism, the "industry without smokestacks," for two solid reasons: to earn foreign exchange and to generate jobs. It particularly wants to encourage tourists to use rapidly expanding hotel and resort facilities and coastal, archeological and historical sites.

In 1979 more than four million foreigners visited Mexico, spending an average of \$35 per day, border town visits included. Trips of one day or less -- classified as border transactions -- resulted in expenditures of \$1.954 billion in Mexico while tourists who spent more than one day left behind \$1.429 billion in current accounts income.

More than 750,000 jobs are said to be directly linked to tourism. Whereas, according to Wayne Cornelius, the cost of creating an additional job in the petrochemical sector is an average of \$250,000, that same amount will create ten jobs in the tourism sector. ^{42/} Tourism is thus an important enterprise for Mexico.

The National Plan for Touristic Development concentrates primarily on providing credits and incentives to domestic entrepreneurs to invest in hotel and resort development; it presumes that foreign concerns will have more than ample access to credit sources of their own. The Mexican plan promotes quality but economical facilities that will attract the domestic consumer as well as the foreigner, leaving luxury facilities to foreign capital or Mexican capital without benefit of subsidy. In addition, the government wants to promote "popular tourism" among people of more modest income by means of creating inexpensive facilities.

The FONATUR trust fund under Nacional Financiera is the principal organ responsible for offering preferential credits for such touristic investments. It was responsible for 70 percent of the \$90 million in sectoral investments carried out under official promotion programs during the first three years of the Lopez Portillo Administration. The Finance Ministry has also incorporated tourism into the CEPROFIS pro-

gram, granting Mexican businessmen tax credit certificates valued at a certain percentage of the fixed asset value of their investments.

Mexico is also conscious of the need to encourage its own nationals to spend more of their leisure income at home. However, current inflation both encourages Mexicans to travel abroad and hurts the competitiveness of Mexican tourism internationally. With the overvaluation of the peso, Mexicans find it increasingly attractive to vacation in the United States or in Europe. The subsequent foreign exchange drain severely eats up the earnings of the domestic tourist industry. In 1979, the \$692 million which Mexican tourists spent abroad reduced the net non-border tourism earnings of Mexico down to \$737 million. A surge in inflation, a boom in Mexican visits abroad, and recession in the United States caused Mexico's net tourism account to slip into deficit during the second half of 1980. Early reports suggested that the year would end with a tourism deficit for the first time in ten years. 43/ This is perhaps the most striking evidence available of the impact of inflation and the overvaluation of the peso.

D. Trouble in Agriculture and the Presidential Response (SAM)

1. Obstacles in Consolidating the Plans

The Global Plan saw its preparation delayed in 1979 by disputes over sectoral policy and by the naming of a third minister to head SPP, Miguel de la Madrid Hurtado. Most drafts of the Global Plan at this stage assumed that Mexico would enter the GATT and projected policy adjustments accordingly. Mexico had already announced plans in 1977 to gradually replace import licensing with tariffs, in accordance with GATT charters. However, as negotiations proceeded and the debate over the GATT grew at home, any general projection of policy was withheld. At the same time it became clear that the agricultural section needed attention.

2. The Story Behind the Mexican Foodstuffs System (SAM)

The plight of the agricultural sector held up release of the plan for that sector and, in turn, the Global Plan. Stagnation and drought caused one bad harvest after another during the 1970's. Mexico was

forced to import more than 3.4 million metric tons of corn, wheat, sorghum, and soya in 1978 and more than 3.6 metric tons of these grains in 1979. Due to a severe drought in 1979, which caused a 3.5 percent decline in basic agricultural output, grain imports rose to 7.2 million metric tons in 1980.^{44/} Deterioration in the rural sector, combined with inflation, was causing severe hardships for the traditionally impoverished small landholders in the rain-fed regions. This situation provoked the President to give his approval to a team of tecnicos in the Office of the Presidency to prepare the Mexican Foodstuffs System (SAM).

No Mexican president ever goes through office without voicing a concern for the rural sector or without spending millions on rural development. Lopez Portillo announced early in his administration that food production and rural development would receive prime attention. Most investments during his first three years in office focused on petrochemical and primary industrial sectors. By 1980, agriculture began to inch up in its share of public investment, surpassing 15 percent of a greatly expanded aggregate investment budget. Still, compared to the need, Mexico was not keeping pace.

Two legal regimes characterize contemporary rural Mexico: the private sector and the ejidal reform sector. Both feature great disparities in scale, capitalization, and production. Some private units are large, modern, and feature diverse output, but most are small, impoverished plots of under six hectares. The ejidal sector was created by Mexico's agrarian reform which, over a span of more than forty years, involved the restoration of more than 57 million hectares to peasant communities. Some ejidos in the irrigated zones prosper. However, most are poorly organized and lack capital. Since ejidal units cannot be sold or mortgaged, ejidal producers are wards of the State and depend on public sector credit, which has never been proportionate to needs. During the Echeverria administration, a short-lived effort was made to promote collectivization of many ejidos so that they could become channels for investments and improved production; but political inertia, poor administration, and the insufficiency of resources frustrated the effort. Rising expectations on a mass level among peasant leagues within and without the PRI inspired a rash of occupations of private and public lands which Echeverria was unable to reverse. Boycotts by the private sector against the seized areas and the further decline of private investment in agriculture persuaded political leaders to steer a differ-

ent course. 45/

Lopez Portillo expropriated and effectively delivered only 754 thousand hectares to peasants during his first three years of office. If this pace is maintained until 1982, his administration will have transferred less land under the agrarian reform than any Mexican presidency in the last 50 years. 46/ Instead, the present administration has opted for a different course. Speaking of the agrarian reform, Lopez Portillo has said, "Sooner or later this banner, planted in the highest part of the revolutionary triumph, had to be overtaken by others...[T]here is another that we should wave with special enthusiasm: that of output, productivity, and income." 47/ The administration, therefore, launched the Sistema Alimentario Mexicano (SAM) to address the needs of the small, marginal landholder and increase agricultural productivity, particularly in the rain-fed areas.

The unveiling of SAM in the spring of 1980 gave substance to the Lopez Portillo philosophy of how to tackle the rural dilemma. SAM is a package of strategies involving investments, credit, subsidies, insurance, commercialization, and a mass media approach to improving nutritional habits among the poor. An outstanding innovation, it designs incentives and policies to reach and stimulate the marginally rain-fed sector, neglected in past policies.

SAM is specifically designed to enable Mexico to achieve self-sufficiency in corn and beans by 1982 and offer at least minimum sound nutrition to the poor, rural sectors. The instruments for seeking this result are:

1. Preferential rates of credit for the production of corn and beans.
2. A 30 percent subsidy on fertilizers and insecticides to producers of corn and beans.
3. A 75 percent subsidy on the purchase of improved seeds.
4. An interest rate of only 3 percent on crop insurance for these basic items.

In addition, SAM provides for the establishment of new CONASUPO storehouses and distribution centers in priority rural areas. SAM identifies 782 townships as "critical nutrition zones" which will receive the brunt of the benefits.

During the 1980 season, 100,000 acres of productive lands selected from among these townships participated in the shared risk insurance program. The acreage will be expanded in the future. SAM also plans to stock 77 reservoirs with fish that will be harvested for rural consumption. These efforts, in addition to a publicity campaign, will attempt to provide a minimum "balanced basket" of food for the rural poor. The 1980 planting cycle saw a 75 percent rise in the amount of land dedicated to corn and bean production. The seasonal rains arrived late, but were sufficient. Preliminary reports on the harvest were highly promising. Not only did production spring back from the drop caused by the drought in 1979, but yields also showed a big increase over previous years. In December, Agricultural Minister Merino Rabago reported a basic grain and oleaginous seed harvest totaling 23.5 million metric tons. This represented a 29 percent increase over 1979 and an 11.1 percent increase over the harvest for 1978. Clearly this rate of increase cannot be maintained over the medium or long term, but the results for 1980 were encouraging to backers of SAM and government planners hoping to reduce the burden of grain imports. 48/

SAM has not created a new agency or bureaucracy but instead is a policy statement and a strategy which has been added to the plan for Agroindustrial Development released by the Ministry of Agriculture and Irrigation. As a political act, the establishment of SAM satisfied one major part of the President's planning scheme and addressed the needs of a major part of the PRI constituency. This accomplishment, along with the decision to postpone entry into the GATT, cleared the way for the release of the public version of the Global Development Plan -- the umbrella framework for all of the particular and sectoral plans.

E. The Global Plan

The Global Plan is the inductive outgrowth of a series of prior sectoral plans which matured at different rates and according to the changing perception of priorities. For instance, the Industrial Plan, released in 1979 and based on a model incorporating a projection of current policies, predicted only a 2.4 percent annual expansion in agricultural, forestry, and livestock output. The Global Plan, on the other hand, released after the unfurling of SAM, projects a 4.3 percent annual increase in output for the same sector. Different suppositions can be noted through-

out, but many general and ideological strands are common. Such strands must be considered in order to understand how Mexican leaders envision their country and what they want it to become.

1. Main Points of the Global Plan

The Global Plan is divided into two volumes. The first explains general principles, analyzes the present situation of the different social and economic sectors, and describes the policies to be applied to each. Volume two contains an annex which describes the model upon which the Plan's projections are based, and which further elaborates expenditure and investment priorities. Volume one addresses issues in the following order:

1. political philosophy
2. socioeconomic diagnosis
3. actions and results, 1977-79
4. national objectives
5. bases of policy and justice
6. general employment strategy
7. macroeconomic framework
8. expenditure policy
9. general political-economic policy
10. energy policy
11. sectoral policy
12. regional policy
13. social policy
14. wage, price, and profit policy
15. general outlook

As should be evident, the Global Plan focuses as much on general, political, and ideological questions as it does on strictly economic ones. This is an important matter from the view of Mexico's leadership. Since Mexico has traditionally been a weak, vulnerable, and dependent nation, the call to rally in support of basic principles serves an important identity function which Americans should try to appreciate. The portion of the Plan dealing with "political philosophy" basically reasserts the guiding principles of the Constitution of 1917: government by law, nationalism, mixed economy, respect for human liberty, and dedication to a "national project" of economic development and social transformation. Thus rooted in the traditional ideals and tenets of Mexican leadership, the Plan is able to present national problems on a common terrain.

In addressing the socio-economic situation of Mexico, the Plan states that the last 40 years have

seen the buildup of a great base of industry, highways, communications, irrigation works, and social services. However, it points out the many inadequacies of this achievement:

This pattern of development symbolized a strategy adequate to its epoch. Nevertheless, with time it began to show signs of insufficiency, notably sharpened by demographic pressures, which manifested themselves principally in the stagnation of agriculture. 49/

The difficulties faced by Mexico after 1970 are attributed to an exhaustion of older strategies. The Global Plan attempts to reshape older policies under a new guise and with different focus. It aims to use petroleum revenues to generate employment. Jobs are set to expand by 4.2 percent yearly, meaning the creation of 2.2 million jobs by 1982. As noted in the Plan,

The strategy is oriented fundamentally towards the creation of jobs. This goal of growth while generating jobs sufficient for the population, in a decent life setting, and the advances towards that end realized in this administration, distinguish, fundamentally, our growth process from that of previous decades. 50/

According to the Plan, jobs will be created by raising the overall rate of growth, decentralizing industry, providing incentives to small and medium-sized firms (whose employment absorption is greater), providing additional incentive to expand payroll or add extra shifts, and increasing investments to the rural sector where unemployment is most severe.

The macroeconomic goal is to attain an 8 percent average annual expansion of GDP. This will mean a net per capita increase of 4.5 percent and, as the birth-rate declines -- a 2.5 percent rate of population increase is the goal for 1982 -- the per capita increase should rise. Imports, according to the Plan, will rise 20.8 percent on the average, while exports should climb by 14.4 percent yearly. Mexico would thus manage to maintain a current account deficit of less than one percent of GDP. Excluding factor payments and profit remissions, this would mean a surplus ranging from 1.0 percent to 1.5 percent of GDP.

On the investment front, the Global Plan calls

for a sustained annual rise in real capital expenditures of 14 percent for the public sector and 13 percent for the private sector. Gross capital formation should rise from 19 percent to 27 percent of GDP by 1982. Investments in the rural sector are charted to increase by 22 percent yearly. Annual increases for communications and transportation will be 18 percent; social investments, 20 percent; and increases in the non-petroleum industry, 17 percent.

The Plan projects a 10.8 percent annual expansion in output for the industrial sector as a whole. Broken down into broad sectors, the following rates of expansion are set as goals:

manufactures - 10%
capital goods - 13.5%
popular consumption items - 8% (double the 1970-1978 rate)
chemicals - 9.7%
energy - 13.1%

The Plan establishes the goal of a 6.7 percent rate of expansion for services. The rate for communication and transport will be 9.5 percent. Growth in the commercial subsector will be limited to 6.7 percent because of the government's aim to eliminate numerous middlemen and inefficiency. According to the Plan, "the policy of commercial promotion and development will continue to try to create an efficient trade structure, eliminating unnecessary intermediaries and attending to popular needs by means of an integrated network of storage and supply houses." ^{51/} This refers to expansion of the CONASUPO system in rural areas where market access has traditionally been distorted.

2. Guidelines for Spending the Oil Revenues

The investment goals established by the Plan are "obligatory" for the public sector and "indicative" for the private sector. The Plan includes an interesting description of how the State will divide and assign surpluses made available by the 1.5 million barrels per day in oil exports which the government has set as the export "ceiling" until 1982. According to this estimate, income from PEMEX will total approximately \$40.5 billion between 1980 and 1982. This sum will represent 22 percent of the investment resources available to the public sector. Of this 40.5 billion, 32 percent will be invested back into PEMEX. The remainder will be allocated to investments in "priority sectors:" 25 percent to agricultural and

rural development; 20 percent to investments in health, education and public assistance; 20 percent to transportation; 16 percent to industrial sectors including electricity, steel, fertilizers, and other basics; and 15 percent to capital expenditures by the state governments. 52/

3. Discrepancies Between the Global Plan and the NIDP

As pointed out above, the Global Plan is more recent than the NIDP and is based on revised and more comprehensive figures. Projections based upon the Global Plan model vary from those based on that of the NIDP. Some discrepancies are major (as in the case of agriculture and fishing). The overall goal for GDP expansion in the NIDP is 10 percent per annum by 1982, compared to a more conservative, albeit still ambitious, 8 percent in the Global Plan. The NIDP is less optimistic, on the other hand, in the area of employment generation. It supposes a 3.6 percent annual growth in jobs, compared to 4.3 percent in the Global Plan. Since the NIDP assumes a higher rate of growth in GDP, it also naturally projects a greater demand for imports. However, it presumes a lower rate of inflation (12.7 percent versus 13.8 percent).

V. EVALUATION OF THE PLANS AND INCENTIVES

How have the plans worked during the twenty-two months since the Industrial Development Plan was announced? Which incentives have been used and to what effect? The response to Mexico's plans will be examined in the light of Mexico's economic experience and the politics of the past and present.

A. The Politics of Planning Since 1977

Mexico's planning system, centered around the SPP, did not get off to an easy start. November, 1977, saw the dismissal of two top cabinet officials over a dispute about whether to move Mexico slowly towards growth or to rapidly increase government spending to hasten expansion and lead the way in priority investments. In the end, Mexico settled for rapid growth and high inflation. The figures indicate Mexico's course:

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Percent rise in GDP	2.1	3.3	7.3	8.0
National CPI	100.0	126.2	147.6	172.7 <u>53/</u>

After three years of recession, the economy began to recover in 1978. Investments in the petrochemical sector led the way and soon demand throughout the economy began to surge. But the response on the supply side was not sufficiently elastic to bring price stability. For three straight years the Lopez Portillo administration was able to bargain successfully for moderate wage hike demands from the CTM, Mexico's chief labor union, in exchange for promises to hold down inflation, but prices continued to outpace wages and real purchasing power waned. As a countermeasure, the government controlled prices on popular consumption items at low levels, but -- as might be expected -- this led to shortages, speculation, and sharp increases in price when supplies began to dwindle. Price controls on transportation, however, which have not changed for years, continue to be a mainstay in maintaining labor peace. Utility rates began to increase more regularly in order to avoid decapitalization of public sector enterprises. A gallon of regular gas today costs about fifty cents in Mexico. When the government raised the price of premium unleaded fuel in November, 1980, to levels approaching those in the United States (about \$1.15 per gallon), it left regular, or "normal," gas, which fuels most Mexican automobiles, at a price well below its value. Diesel fuel is similarly subsidized. This offsets inflation in some sectors but denies savings to other sectors of the economy.

Instabilities at home were complicated by uncertainties on the international scene. Mexico's 1979 NIDP projected a rapid rise in manufactured exports to complement and balance the surge in oil exports. However, multiple factors entered the picture to make that scenario unlikely in the short run. First, the world entered a new recession in 1980, decreasing the demand for Mexican products abroad. Second, rapid expansion at home absorbed many products which otherwise might have been available for export. In addition, the appearance of serious bottlenecks in several important sectors -- transportation, electricity, textiles, etc. -- required that additional resources be directed toward their relief before an export base could be established.

The overvaluation of the peso is another important factor. Mexican inflation has steadily outstrip-

ped United States inflation, causing an inevitable decline in the competitiveness of Mexican goods. Since Mexico continues to carry out more than 65 percent of its trade with the United States, a slippage of the dollar in comparison with other currencies at the end of the 1970s did little to help Mexican exports to other countries. Great efforts are being made to promote new markets, but access to European and Japanese buyers is still restricted. Mexican financial leaders are facing the consequences of an overvalued peso on export trade.

Mexico is so accustomed to pegging the peso to the dollar that the subject of devaluation carries with it a heavy political burden, resulting from a perception that the United States is to blame and Mexico is being manipulated. Devaluation seems to have an extraordinary symbolic importance. Policy-makers are not ready administratively to handle the complex set of adjustments inherent in a system of mini-devaluations. Nor are Mexican businessmen accustomed to the world of indexization and permanent inflation which flexible exchange rate policies tend to bring. In the meantime, Mexican leaders have finessed the issue by assigning to the Banco de Mexico the task of floating the peso in such a manner as to achieve a modest devaluation against the U.S. dollar, but with minimal required adjustment in the system.

B. Mexico and the GATT

Mexico decided to postpone entry into the General Agreement on Tariffs and Trade (GATT) for a number of reasons. In the fall of 1979, with the completion in Geneva of the protocol for Mexico's entry, President Lopez Portillo invited a "public discussion" of the pros and cons. The issue became a hot topic in the press and among special interest groups and other organs of public opinion. Labor unions were highly critical. They feared that restructuring protective barriers would result in a loss of jobs that could not be regained by long-term promises of job creation within the scheme of "comparative advantage." The leaders of Mexico's CONCAMIN industrial confederation were prepared to comply, but the largest group within that body, CANACINTRA, composed largely of medium and small manufacturers, was unconvinced by the terms offered within the protocol for a very gradual customs adjustment. Who, asked CANACINTRA, would interpret the application of the terms? The negotiating position of LDCs within GATT was also regarded as very weak,

leading some to see little future for improvement.

CANACINTRA spokesmen confronted the government with a list of twenty-one questions concerning the impact GATT entry would have on the Industrial Plan and its incentives package. The government was unable to respond, first, because no one could provide sure answers, and second, because support for GATT entry was dwindling within the government itself. By early 1980, GATT's only proponents were those in the Ministry of Commerce charged with negotiating entry. 55/

Officials in the Ministry of Patrimony and Industrial Promotion (SEPAFIN) were among the staunchest opponents of GATT. "A decision to enter and form part of the nations represented by the Accord would necessarily imply a revision and adaptation of the National Industrial Development Plan," suggested Subsecretary Albert Perez Aceves before the decision not to enter was announced. SEPAFIN Minister Oteyza characterized GATT as "a club of the powerful that does not respect its own rules," and warned that GATT would impose "unilateral limitations on Mexico's development." He warned especially against a "dangerous current" growing within GATT "oriented towards the establishment of guarantees in the supply of strategic resources like petroleum." Such measures would deprive Mexico of an important bargaining tool. Oteyza rejoiced at the rejection of the "siren's call" when the decision to postpone entry was made. 56/

The balance of opinion within the cabinet was decidedly against GATT when Lopez Portillo made his decision in March, 1980. Finance, SEPAFIN, SPP, and Foreign Relations were all opposed. Although the protocol offered ample and exceptional terms of entry to Mexico, growing protectionist sentiment in the industrial nations suggested that the protocol's guarantees might not be fulfilled in practice, and that measures might be imposed that would be detrimental to Mexico's interests. In his September State of the Union Address, President Lopez Portillo expressed this concern when he said:

Dumping and unfair trade practices are the order of the day everywhere. The powerful are the first in infringing on the rules of the game of world trade, in not defining codes of conduct, or in modifying them according to convenience. For this reason, in support of our industrial development policy, which requires congruence in our dealings abroad, we decided to delay our even-

tual entry in the GATT. We must not allow that what is woven in one part of our development be unwoven in another. 57/

Mexico's immediate alternative to entry into GATT was to pursue trade negotiations on bilateral fronts and through other forums. In addition to the consultative mechanism with the United States, Mexico hoped to achieve concessions from the United Nations' North-South talks which began in August, 1980. In the opinion of Foreign Relations Economic Affairs Subsecretary Jorge Eduardo Navarrete, "The GATT is not the only multilateral negotiating forum; there are others in which Mexico participates and in which, it is to be expected, important decisions will be produced, particularly with regard to trade between advanced countries -- capitalist and socialist -- and those in development." 58/

However, in the interim it must be said that the decision to stay out of GATT caused many problems. Mexican exporters now face greater uncertainties, as the application of the U.S. countervailing duties legislation allows little flexibility in cases of exporting countries not members of the GATT. Mexico's avowed intentions of mounting a substantial non-oil export campaign face even greater obstacles, however, primarily economic, and its chief development motor for the foreseeable future will undoubtedly be its domestic market. 59/

C. Domestic Boom, Import Expansion

The Mexican economy has undergone a great de facto opening in the last two years. Imports increased by 52 percent in 1979 and by 58 percent during the first three quarters of 1980 over the corresponding prior periods. Rapidly advancing demand, coupled with scarcities and inelasticities, caused a \$4.87 billion current account deficit in 1979. Huge increases in oil and gas revenues between 1979 and 1980 -- from \$3.8 billion to \$9.9 billion -- did not keep the current account deficit from growing to \$6.6 billion. The demand for imports shows no sign of cooling. Current account pressures could require a slowdown in growth or a rise in the 2.7 million barrels per day (1.5 million bpd for export) oil production ceiling, depending upon how rapidly the price of crude increases.

On the other side of the balance, non-oil exports are sluggish. Although manufactured exports rose by 14

TABLE V 60/
FOREIGN TRADE

	(US \$ thousands)		Percent Variation
	January-September 1979	1980	<u>80/79</u>
TOTAL IMPORTS	8,749,798.	13,831,351.	+ 58.1
1. Agriculture and Forestry	551,997.	1,243,772.	+125.3
2. Livestock and Fishing	110,779.	91,704.	- 17.2
A. Livestock	106,289.	85,921.	- 19.2
B. Fishing	4,481.	5,783.	+ 29.0
3. Extractive Industries	175,608.	187,737.	+ 6.9
A. Crude Petroleum, Natural Gas	6,074.	6,288.	+ 3.5
B. Metallic Minerals	43,630.	42,134.	- 2.8
C. Other Minerals	87,986.	96,323.	+ 9.5
4. Manufacturing Industries	7,370,248.	11,482,977.	+ 55.8
A. Food, Beverages, Tobacco	214,030.	775,494.	+262.3
B. Textiles, Clothing, Leather	103,602.	184,216.	+ 77.8
C. Wood Products	28,231.	53,886.	+ 90.9
D. Paper, Newsprint, Books	239,760.	433,674.	+ 80.8
E. Petroleum Byproducts	189,618.	223,658.	+ 17.9
F. Petrochemicals, Plastics	355,797.	649,879.	+ 82.6
G. Chemicals	789,636.	1,114,860.	+ 39.6
H. Non-metallic Mineral Products	74,293.	118,307.	+ 59.2
I. Iron and Steel	793,932.	1,376,567.	+ 73.4
J. Metallic Mineral Products	190,899.	272,591.	+ 42.8
K. Machinery, Tools, Equipment	4,341,161.	6,216,233.	+ 43.2
L. Other Industries	40,288.	63,592.	+ 57.8
5. Services	5,904.	10,966.	+ 85.7
 TOTAL EXPORTS	 6,132,968.	 10,954,162.	 + 78.6
1. Agriculture and Forestry	1,266,776.	1,136,743.	- 10.2
2. Livestock and Fishing	55,864.	85,612.	+ 53.2
A. Livestock	49,520.	76,016.	+ 53.5
B. Fishing	6,344.	9,596.	+ 51.3
3. Extractive Industries	2,658,474.	7,449,662.	+180.2
A. Crude Petroleum, Natural Gas	2,462,716.	7,103,949.	+188.5
B. Metallic Minerals	57,499.	157,204.	+173.4
C. Other Minerals	138,045.	188,510.	+ 36.5
4. Manufacturing Industries	2,150,871.	2,279,085.	+ 5.9
A. Food, Beverages, Tobacco	526,009.	488,244.	- 7.1
B. Textiles, Clothing, Leather	152,316.	138,770.	- 8.9
C. Wood Products	54,569.	42,004.	- 22.9
D. Paper, Newsprint, Books	55,025.	56,836.	+ 3.3
E. Petroleum Byproducts	55,503.	305,771.	+450.9
F. Petrochemicals, Plastics	98,712.	94,135.	- 4.6
G. Chemicals	245,015.	280,810.	+ 14.6
H. Non-metallic Mineral Products	97,534.	95,181.	- 2.4
I. Iron and Steel	104,632.	48,513.	- 53.6
J. Metallic Mineral Products	108,457.	90,481.	- 16.5
K. Machinery, Tools, Equipment	618,130.	606,160.	- 1.9
L. Other Industries	34,968.	32,141.	- 8.1
5. Services	848.	234.	- 72.4

percent from 1978 to 1979, figures for the first three quarters of 1980 show a current dollar improved performance of only 5.9 percent over the same period a year earlier. This indicates a real decline in volume. The government has resorted to increased application of CEDI tax credits to a select list of exports in order to help sustain sales in the face of recession abroad and overvaluation of the peso. During the first eight months of 1980, the Ministry of Commerce authorized \$130 million in export tax credit certificates, corresponding to a quantity of goods whose sales totalled \$1.37 billion. 61/

D. The SPP and the Budgeting and Planning Process in Action

An environment of inflation, uncertainty, political maneuvering, and pressures both at home and abroad forms the climate in which the Mexican planning apparatus must operate. In this section we will examine the procedure by which government leaders make investment decisions. Later we will see what happens to these investments in practice.

The Mexican government currently makes about 45 percent of all investments in the economy. That figure is likely to rise over the coming years. Therefore, the public sector budget determines the pace at which the economy will grow and establishes the sectoral priorities. Private investment follows this lead by taking advantage of public works and basic industries set up by the government and through a cooperative process of meeting with government officials to coordinate sectoral and regional priorities.

1. Two Key Positions and the People Who Hold Them

The SPP minister bears chief responsibility for achieving this coordination both within the government and with the private sector. He is the chief planning deputy and chairs the process of preparing each year's budget. Current SPP Minister, Miguel de la Madrid Hurtado, 46, is considered a leading candidate to succeed President Lopez Portillo. De la Madrid holds a degree in law from the National University of Mexico and a Masters in Public Administration from Harvard. From 1953 to 1957 he served in the Legal Department of the National Foreign Trade Bank. Between 1960 and 1965, he functioned as a consultant to the management

of the Central Bank. For the next five years he was Subdirector of Credit in the Finance Ministry, and between 1970 and 1972 he served as Subdirector for Finances in PEMEX. After being promoted to General Director for Credit in Finance in 1972, Lopez Portillo (while Finance Minister under Echeverria) chose him as Subminister. He remained in that position until replacing Gustavo Garcia Sainz as SPP Minister in May, 1979. De la Madrid's entire career has been as a public administrator. He has been involved from the beginning in financial and programming matters which relate directly to the nature of his present charge. In the political arena he is viewed as a "practical politician" -- an administrative leader who has been drawn into politics because of his experience. 62/

Finance Minister David Ibarra Munoz plays the corresponding key role in applying tax policies and providing resources for the government's investment programs. Ibarra is also a technocrat whose career has been entirely in public and official party positions. After earning a degree in economics and accounting at the National University, he did his doctoral work at Stanford. Subsequently, he served with the ECLA Economics Institute of the United Nations, the Institute for Political, Economic, and Social Studies of the PRI Party, and in assistant positions in the Ministry of Finance until he was named its head in 1977.

2. The Budgetary Process

Traditionally, the public sector budget has been prepared by executive discretion with little public participation. The administration still faces few specific political constraints, but the political reforms instituted by the present administration have strengthened the role of minority parties and increased the amount of information supplied to the public on government decisions. The Ministers of SPP and Finance are, therefore, now required by law to defend the annual budget and tax law before the Chamber of Deputies in November. The sessions must be broadcast by radio and television. Although an overwhelming PRI majority in the legislature and traditional legislative subservience to the wishes of the executive branch deters any real challenge to the government's plans in the Congress, the process has at least been opened up more to public opinion than in times past.

In putting together the gross public sector budget, the separate ministries and the main public sector enterprises must prepare an annual program. This

program is expected to follow the guidelines of the Global Plan. Budget requests are reviewed by the SPP, and final agreement is reached through a process of arbitration and consultation. It is difficult to state how specific decisions are reached because so much of this process is closed to public view, but Cabinet figures endeavor to maintain a public image of consensus and collegiality.

Since 1976 the budgeting process has been much more centralized than in previous times. The SPP maintains a data bank on all sectors of government activity. Different bureaus under its charge cooperate with planning officials in the separate specialized ministries. Prior to the release of the Global Plan in 1980, the SPP articulated the general principles upon which each ministry was to frame its annual program. Now the Global Plan spells out the guidelines.

3. Public Sector Expenditures, 1978, 1979

Public sector expenditures are divided into the direct federal budget (about 70 percent of the total) and the budgets of public sector enterprises. In 1978, 53 percent of the federal budget went to current account expenditures (salaries, benefits, transfers, and operating costs), and 17 percent went to amortization of the public debt. The remaining 30 percent went to capital investments, a sum equal to \$9.6 billion or about 11 percent of GDP. That same year, total federal expenditures varied from the original budget by only 1.8 percent -- a very good finish, given inflationary circumstances and the generally poor fiscal performance among most developing countries. However, the fact that the public deficit equaled 6.8 percent of GDP shows that the government sought expansion at the expense of price stability. That much was planned. But the government was forced to intervene in certain sectors to face unplanned crises. For instance, the subsidy budgeted to CONASUPO for 1978 for domestic grain sales was \$305 million, but poor harvests and mounting demand required that 49 percent more than that, or \$454 million, be transferred. Such examples can be found in the case of any government, but agriculture is a particularly weak area in the case of Mexico. 63/

The Global Plan and the NIDP present forecasts for inflation and the evolution of public expenditures. Since inflation has exceeded the forecasts of both, it has been necessary to use judgments independent of the plans to determine public sector spending

increases from one year to the next. However, the government still aims to achieve the planned investment increases in real terms. Preliminary figures for 1979 indicate that the public sector invested a total of about \$13 billion. This fell short of the amount authorized for that fiscal cycle by about 9 percent. In 1978 the shortfall was only 3 percent. The Global Plan projects a 14 percent real annual increase in public investments leading towards 1982. The table below compares nominal and real rates of increase in recent years, using the CPI as a deflator. 64/

	<u>1977</u>	<u>1978</u>	<u>1979</u>
Amount (US \$ billion)	6.1	9.45	13.76
Percent nominal increase	29.6	55.2	44.3
Percent increase in CPI	28.9	17.5	18.2
Percent real increase	0.7	32.0	22.1

The rate of investment increase in 1977 was low because of the recession and austerity policies. However, 1978 took a sharp upward turn, and in 1979 the government continued to increase investment rapidly. Many correctly question the use of the official CPI as a deflator, since it fails to account for subsidies, but even if 1979 inflation were 25 percent, the real increase in public investment would still be 15 percent -- not too much above the 14 percent pace set by the Global Plan for the period 1980-82.

A breakdown of public sector investments for 1978 and 1979 shows the following: 65/

(Percent Participation)

<u>Sector</u>	<u>1978</u>	<u>1979</u>
Agriculture, Livestock, Forestry	17.0	16.3
Industry (Petroleum)	48.0 (28.6)	43.5 (22.1)
Communication and Transport	15.7	13.7
Health, Education, Housing	17.0	19.8
Administration, Defense	2.3	3.1

The most pronounced change from one year to the next is a turn away from industry and agriculture

towards the social sector and administration/defense. However, the overall real expansion of more than 15 percent guaranteed a bigger flow to all investment sectors under the government domain.

E. Plan Projections Versus Real Output Expansion: A Look at 1979

Here we will compare the sectoral projections of the Global Plan and the NIDP with actual expansion of output in a given year. Both plans indicate average rates for the expansion of GDP and specific sectors for the spans they cover. Table VI allows us to compare these predicted rates with 1979 data for the respective sectors as reported by the Bank of Mexico.

In some sectors, the plans, especially the more ambitious ones, were not realized, but total growth of GDP was above the 1977-82 average stated in the model of the Industrial Plan. It was also above the 1980-82 annual GDP goal presented in the Global Plan. Most disappointing was, of course, agriculture, since 1979 was a drought year. But it must be presumed that the authors of the Global Plan were counting on better weather and high returns from SAM in order to realize a 4.3 percent rate of growth in agricultural output between 1980 and 1982.

F. Response to the Fiscal Incentive System: Some Data from the Finance Ministry

Response to the NIDP's set of fiscal incentives has been strong and favorable (see Table VII). From September 1979 to September 1980, certificates totalling nearly \$100 million were granted to firms. Applications for certificates were most numerous in the cases of priority industries and the acquisition of Mexican-made capital goods. Five hundred and fifty-four small firms received certificates, and provincial cities in Zones IB and II were very popular. Zone IB cities have received more than 60 percent of the regional incentives granted thus far. Zone II state priority cities have received over 35 percent. Less than five percent have gone to the port cities. This can be attributed to a number of factors.

Zones IB and II include many cities of the central basin and the north of the country (excluding the border, which is subject to policies outside the NIDP). Queretaro, Celaya, Leon, Torreon, San Luis Potosi, and Hermosillo are served by good infrastruc-

TABLE VI

Plans versus Results for 1979 and 1980

Plan projections based on econometric models
used in each

<u>GDP by sector</u>	<u>Global Plan</u>	<u>NIDP</u>	<u>1979</u>	<u>1980 (p)</u>
Agriculture, Live-stock, Forestry	4.3	2.4	-0.1	5.3
Fishing	20.8	3.8	11.0	22.1
Mining	6.3	6.3	4.8	6.5
Petroleum	20.8	25.6	14.7	17.5
Manufactures	8.7	8.6	8.8	5.6
Construction	10.9	11.2	14.1	—
Electricity	8.5	11.4	8.8	6.5
Transport & Communications	8.8	7.9	9.4	10.3
Commerce	7.5	7.7	7.9	—
TOTAL GDP	8.0	8.4	8.5	7.4

ture, have a good industrial and commercial tradition, and have the skilled manpower needed to facilitate investments. In addition, many managers in Mexico City who are formerly from those areas are willing to relocate there.

This cannot be said, however of the Zone IA port areas. Although eligible for a maximum of incentives, they have drawn a meager response thus far. Remoteness, sweltering climate, and the almost total lack of social and cultural amenities make the Pacific coast cities of Salina Cruz and Lazaro Cardenas hardship locations. From an economic point of view, they are afflicted by poor transportation, insufficient utilities, distance from markets, and the scarcity of skilled labor. Tampico, on the Gulf Coast, has received the best response. Coatzalcoacos, by contrast, the site of many new petrochemical facilities, is shunned as something of a "PEMEX ghetto." Private entrepreneurs steer away from the political manipulation and labor turmoil associated with the official presence. Furthermore, Coatzalcoacos is marred by a 70 percent local inflation.

In perspective, the regional incentives have had a useful but not overpowering influence on investment decisions. The transportation, communication, educational, market, and family advantages of the traditional metropolitan zones are still great. The energy and fiscal lures have drawn a significant number of firms to the major provincial cities, but important resistance remains in developing some zones. Mexico City still has its attraction -- despite congestion, pollution, and stress.

The incentive designed to increase employment has met with a disappointing response. The magnitude of the incentive involved (equal to about 5 percent of fixed asset costs in most cases) has not been enough by itself to persuade entrepreneurs to make the long-term commitment required by choosing a labor-intensive technology. Even adding an additional shift becomes a major decision, since the firm must keep that shift in operation for a year after the two years for which credits are received. A minor statistical issue enters in measuring the response to this incentive since a firm can apply for a certificate only three full months after the new jobs have been created. However, the general indications are that the response to this incentive will remain the coolest. "The experience suggests," remarked Fiscal Incentives Director Mauricio Maria y Campos, "that the fiscal route may not always be the best way of getting something done." 68/

Table VII 67/
FISCAL INCENTIVES GRANTED UNDER NATIONAL INDUSTRIAL DEVELOPMENT PLAN
BETWEEN SEPTEMBER 1979 AND SEPTEMBER 1980

CODE:
Number
Value (\$US thousands)

GEOGRAPHICAL ZONES		ZONE I		ZONE II		ZONE III		REST OF THE COUNTRY		TOURISM		TOTAL CEPROFIS ISSUED	
PRIORITY	INCENTIVES	CATEGORY I Capital Goods Agroindustry	A Port Industrial Development	B Urban Industrial Development	PRIORITIES	A Restricted Growth	B Consolidative growth	THE COUNTRY	PRIORITY ZONE	GENERAL ZONE			
	CATEGORY II-Industrial and light consumer goods	815	10,140	3,867	629	1,318	2,698					19,466	554
	SMALL INDUSTRIES	13	285	138	51	67						6,348	49
	New Jobs	146	3,363	1,551	646	643						2,469	8
EMPLOYMENT	Additional Shifts	180	545	1,488	38	219							
		14	312	189	370	66	255					1,206	
	PURCHASE OF NATIONAL MACHINERY AND EQUIPMENT	68	2,220	915	8,774	313	1,962					14,252	32
	TOURISM, HOTELS												
	PRODUCTION OF ARTICLES WITH MAXIMUM VALUE ADDED	1	10	25	50	6	11	4,368	318	4,887		101	
		33	351	1,030	3,505	195	503					3,616	
		43	812	513	421	191	448					2,460	
	TOTAL	1,714	25,986	25,433	12,908	2,741	24,751	4,568	318	98,417			

The largest number of certificates has been granted for the purchase of domestically produced capital goods. At the same time, many of the applicants for this incentive are located in Mexico City. At the very least, therefore, the goal of the NIDP to promote capital goods production is receiving a good response, even if most of the customers are in the most congested areas.

The general trend in Mexican fiscal incentives policy has been away from loose guidelines with ample discretion (which invited favoritism and arbitrariness) and towards universally applied but pragmatically defined rules. The CEPROFIS method represents a step in this direction. CEPROFIS were recently extended as an incentive to Mexican firms to develop their own technology. The government has also set up a shared risk insurance to encourage private firms to undertake more research.

Discussion is underway over whether to make the CEPROFIS negotiable and whether their value should be increased. The former measure would enable a firm to sell its credits if it owed no taxes, wanted to show a profit, and did not want to hold onto its CEPROFIS for another year. Increasing the fiscal incentives would supposedly add inducement to decentralization or to increase employment. However, there are a number of arguments that oppose this. Calvin Blair points out that the fiscal incentives as they stand will have a negative influence on income distribution. He describes this issue as "a major flaw" in Mexico's present development plans. To step up the incentives even further would aggravate the problem. 69/

G. Progress in Diversifying Trade Partners

Mexico's leaders have long sought to diversify their country's trade partners as a means of reducing dependence on the United States and vulnerability with regard to American economic fluctuations and policy decisions. While access to the U.S. market and geographic proximity afford Mexico unparalleled advantages in comparison to other developing countries, Mexico wants to increase trade with West Europe and Japan. However, in the context of the rapid expansion of Mexico's foreign trade at large during the past three years, the portion of trade carried out with the

United States has preserved its historical share. Sixty-nine percent of Mexico's \$8.556 billion exports in 1979 went to the United States. Sixty-seven percent of Mexican exports went to her neighbor to the north during the first three quarters of 1980, despite the U.S. recession. On the side of imports, 65 percent of the \$11.997 billion total in 1979 came from the U.S., a proportion repeated during the first three quarters of 1980. 70/

Mexico plans to sell increasing portions of additional oil exports to countries other than the U.S. As Table VIII indicates, the United States' share fell from 66.1 to 52.9 percent, even though volume increased slightly. Should this trend continue, trade with the United States may fall to 60 percent of Mexico's total foreign trade by 1982.

The total value and volume of trade with the United States can be expected to increase. West European and Japanese competitors may, however, be expected to displace a number of trade and investment opportunities. While the United States' share of direct foreign investment declined only slightly, from 70.1 percent to 69.6 percent, between 1975 and 1979, the West German and Japanese presence increased appreciably. Their shares rose from 6.2 to 7.4 and from 2.0 to 5.3 percent, respectively, during the same time span. Presidential tours to Europe and Asia during 1979 and 1980 underscored Mexico's desire to bolster trade relations with those regions. Major financial and commercial accords were signed. However, the many achievements have also been accompanied by difficulties. Two cases will be examined.

1. France

In 1979 the European Economic Community bought 5.9 percent of Mexico's exports and was the source of 16.3 percent of its imports. These figures increased to 7.3 percent for exports and declined to 13.6 percent for imports during the first three quarters of 1980. France is Mexico's second most important trading partner in Europe. In 1979, Mexico exported only \$71 million in merchandise to France, while importing \$381 million. Exports to France increased in 1980 due to an agreement, signed in 1979, to sell France 100 thousand barrels of oil per day. Petroleum currently represents about 30 percent of sales to that country.

While oil has narrowed the trade gap between Mexico and France, the former continues to face a bilateral deficit. The French are willing to import a

Table VIII
MEXICAN CRUDE OIL EXPORTS BY COUNTRY 71/
(Thousands of barrels per day)

<u>Country</u>	May, 1980		December, 1980	
	<u>Volume</u>	<u>Percent</u>	<u>Volume</u>	<u>Percent</u>
USA	730.0	66.1	733.0	52.9
Spain	160.0	14.5	220.0	15.9
France	100.0	9.0	100.0	7.2
Japan	50.0	4.5	100.0	7.2
Sweden			70.0	5.0
Canada			50.0	3.6
Israel	45.0	4.1	45.0	3.2
Brazil	20.0	1.8	20.0	1.4
India			20.0	1.4
Jamaica			10.0	0.7
Costa Rica			7.5	0.5
Nicaragua			7.5	0.5
<u>Yugoslavia</u>			3.0	0.2
TOTAL	1,105.0	100.0	1,368.0	100.0

variety of semi-manufactured goods from Mexico, but the margins are limited, due largely to EEC commitments to purchase African goods which often compete with those from Mexico. As an alternative, France has offered generous financing and investment packages. A March, 1979, accord reserved 1 billion francs on favorable terms for direct investment projects in Mexico and for the import of French industrial goods. However, the French have been frustrated by slowups and many French firms have been turned down on desired contracts. The original financial agreement was extended, but only about 300 million francs have been used to date.

French officials would like to increase trade with Mexico, especially if it means gaining a secure access to oil. However, they are less eager towards such deals if they stipulate increased imports of Mexican manufactured goods. Private French investors, on the other hand, are attracted to many opportunities in Mexican mining, manufacturing, transportation, and tourism, but they find that their Mexican partners are not used to doing business on European terms. Several contracts have been elaborately prepared, only to be left unsigned or later cancelled. Furthermore, U.S. products and technology enjoy such a domination that it is difficult to induce many Mexican businessmen to change habits and accept deals with the French.

This much said, however, there are a number of positive advances in France-Mexico trade and investments. During 1980 Mexico increased purchases of French iron and steel parts, machinery and equipment, automotive components, and alcoholic beverages. Renault, Creusot-Loire, Alsthom-Atlantique, and other important French firms are involved in consultations and bids over joint-venture and technology transfer contracts. Current and potential leading Mexican partners include PEMEX, Altos Hornos (steel), Las Truchas (copper), Mexican Railways, the Mexico City Subway Company, and the Visa conglomerate. The Mexican Foreign Trade Institute, IMCE, and its French counterpart, CFCE, continue to consult on improving trade and expanding investments. 72/

2. Japan

Japan is the country most vigorously pursuing new trade and investment opportunities with Mexico. It appears to be having great success. Japanese exports to Mexico tripled between 1977 and 1979, reaching over \$800 million. Exports to Mexico during the first three quarters of 1980 were 34 percent above those for the

same period in 1979. Mexican sales to Japan were only \$96.1 million during the year 1978, but when Mexico began exporting 100,000 barrels of crude oil to Japan in 1980, the sales figure rose to over \$295 million during the first three quarters alone. Japan would like to buy from three to five times as much crude, but Mexico has not yet yielded. Just the same, both sides are greatly interested in multiplying non-petroleum trade and investment. 73/

Negotiations are underway for Japanese participation in development projects in the fields of Mexican mining, iron and steel products, transportation and port facilities, petro-chemicals, and fishing. Mexico has presently received nearly \$5 billion in medium- and long-term Japanese capital, and more comprehensive financial and investment packages are underway. In October, 1980, Sumitomo Metal Industries and Kobe Steel announced plans to participate in developing two major plants in Mexico, involving an investment of \$405 million. One is to be a foundry and the other will be a large diameter steel pipe works. SIDERMEX will be their Mexican partner. Japanese firms are cooperating with PEMEX to improve shipping facilities at the Pacific coast port of Salina Cruz. Mexico also hopes to encourage Japanese capital to help develop the Tehuantepec isthmus truck, rail, and pipe route.

A Mexico-Japan Cooperation Committee of public and private sector representatives has been created to promote increased exchange. This centralized, coordinated approach binding government and business pleases the Mexicans because it avoids the problem of conflicting sectoral interests frequently encountered in the case of the United States (the gas and vegetable disputes being but two examples). Japanese banks opened eleven new offices in Mexico during 1980 and plan to open five more in 1981. Back in Japan itself, special trade and investment firms are being created to promote trade with Mexico. Japan has encountered some of the problems faced by France in terms of hesitancy, disorder, and delays on the part of a Mexico struggling to handle rapid domestic expansion, but greater optimism prevails.

Mexico has informed Japan of its wish for a greater role "in the emerging Pacific Basin economy." Currently, a number of non-tariff barriers impede the access of Mexican agricultural goods to the Japanese market, but the medium-term prospects for increased manufactured exports to Japan are good. Mexico wants to use Japanese investments as an important lever in developing the Pacific coast industrial sites of

Lazaro Cardenas and Salina Cruz. Whereas most other foreign interests have shied away from these zones, the Japanese are examining the possibility of exploiting the fiscal and energy incentives offered there. Japan, now Mexico's number two trading partner, may see energy-rich and labor-cheap Mexico not only as an attractive market in itself, but also as an opportune base for exports to the United States. 74/

VI. A LOOK AHEAD: MAJOR TENDENCIES AND CONSTRAINTS

A. Prospects for the Planning Priorities and Their Effect on Economic Policy

The Mexican government plans a total public sector budget of \$101 billion for 1981. This means a 31 percent nominal increase for expenditures above the expected 1980 level, as well as a 38 percent nominal increase in government and public enterprise revenues. Inflation for 1980 was estimated at 28 percent, but government officials hope this will drop to 22 percent in 1981. Their reasoning is that the great mass of investments in 1978 and 1979 will start producing and relieve the supply bottlenecks partially attributable to the fallback in investment between 1975 and 1977. Private sector groups also view 1981 as the year when manufactured exports may become dynamic again. 75/ However, scarce raw materials, insufficient transport, and the pressures of domestic demand will likely delay any surge in exports for at least another two to three years.

Current forecasts predict a 7.5 to 8.0 percent growth in GDP for 1981. As may be noted, projections have become more and more cautious since the 1979 NIDP presented 10 percent annual GDP expansion goals. Nonetheless, the government intends to keep growing at rates above the historical 6.1 percent. Accelerated growth makes improved planning and coordination a "do or die" necessity, even if formal planning goals prove elusive. This means the current penchant for planning is likely to remain a feature of Mexican economic policy-making.

Plans continue to roll off the presses. An Energy Plan was unveiled in late 1980. While most of it consists of general projections of needs and utilization for the coming years, it also contains the

important policy decision that Mexico will avoid selling more than 50 percent of its petroleum exports to any one country.^{76/} This is an obvious expression of the desire to reduce dependence on the United States, which has bought about 70 percent of Mexican crude oil exports until now. The Energy Plan also sets formidable goals for Mexico to reach in multiplying output and domestic distribution of gas, fuel oil, and electricity in the upcoming years. The Energy Plan is binding only as long as the umbrella Global Plan itself is binding -- until 1982. But the successor to Lopez Portillo will be handed expansionist plans and an institutional pattern which makes petroleum revenues continuously available to other sectors of the economy in a visible fashion.

The plans have an important political dimension. Not only do they define general guidelines for action, they also embody the efforts of the Lopez Portillo administration to restore confidence and unity after a rough decade. In addition, they represent a contract to the major sectors of society on how they can expect to share in future economic growth. The Global Plan spells out graphically how the oil revenues will be spent and Mexico's citizens are expecting to see the benefits widely shared.

In the United States, by contrast, any plan suggesting that the government assume increasing shares of total investment and economic activity would be severely criticized by business groups. The Mexican system operates differently. Even when entrepreneurs have a complaint, they generally preserve the public harmony and opt to negotiate by confidential means. The private sector, along with all organized groups is obliged by custom to warmly welcome each of the plans as they are made public.^{77/} Privately, many business figures voice uncertainties or misgivings about the rate of expansion of the budget, price controls, and inflation; but, on the whole, the present government has given them little about which to complain. Business leaders are much happier than they were in 1976. The government plans, far from posing a threat, offer a guide to public sector intentions and investments. Mexico's private sector depends traditionally on initiatives from the government, and most signals from the present administration have been good.

B. Labor and Agriculture

Labor has a different stake in the matter. Infla-

tion has eaten away buying power from the wages organized labor (about 15 percent of the working force). Since the PRI cannot ignore this bastion of support, price controls and subsidies have been offered in lieu of greater wage hikes. Leaders, such as the octogenarian Fidel Velazquez, head of the CTM have expressed reservations, but have not blocked implementation of official policies. On the whole, labor favors increased state participation in the economy and, therefore, endorses the plans. The Global Plan and its complementary Employment Plan offer verbal reassurances that purchasing power will be protected, but from 1977 to 1979 the government tried to fight inflation by keeping labor cheap and manpower absorption elastic. When asked about wages, SPP Minister De la Madrid responded by pointing out how rapidly the total sum of wages paid continued to rise. With regard to inflation, his response was that "we cannot aspire to a drastic drop in inflation while we are immersed in an inflationary world, including West Europe, the United States, and Latin America..." ^{78/} But deteriorating purchasing power among organized workers subject to wage legislation caused pressures for more generous periodic wage adjustments. The government yielded in December, 1980. An increase in the minimum wage, ranging from 25 to 39 percent, depending on the region, was granted. However, the government also took the opportunity to increase the prices of corn and tobacco products. Corn subsidies cost the State \$350 million during 1980.

The crisis in Mexico's rural sector is as old as the nation itself, and it should be no surprise that the present administration is pressured to address it in some fashion. But agricultural stagnation has been a major source of Mexico's inflationary pressures, and recent increased hardships are pushing poor peasant families to the breaking point, thus threatening national stability. SAM was conceived as a policy not just to raise gross output, but to improve nutrition among residents of Mexico's most deprived sectors. Its goal, to achieve a minimum balanced food production among the rain-fed regions' peasantry by 1982, is certainly difficult; but the quantity of resources being assigned to agriculture suggests that the effort is serious. The real test will be whether the team of activists close to the presidency which conceived SAM can transmit its innovative strategies through the bureaucracy into action and results.

Mexicans fear increased food dependence in an age of "food power" and growing world scarcity. What new negotiating power oil gives them could be cancelled by an upsurge in food dependency. This would be a blow to

national security. 79/ SAM becomes, then, doubly important. Whether self-sufficiency in basic grains can be achieved is a point of disagreement even among those involved in SAM. 80/ However, even the pessimists are resolved to do all that is feasible toward that end.

C. The Leadership of the PRI and the Future of Mexico's Plans

Will the next generation of leaders in Mexico continue the policies of the Lopez Portillo administration? Of necessity new leaders must make changes to separate themselves from their predecessors and inaugurate schemes bearing their own mark. This fact alone will mean a period of re-evaluation and adjustment of the course set by Lopez Portillo. Moreover, the PRI party, never a monolith but rather an amalgam of ideologies from moderate right to far left, could swing away from the present pragmatic balance. However, a review of the principle elements in the party suggests that continuity, rather than radical change, is much more likely for the next Presidency. This means that, in broad outline, the principles of the plans now in place will be recognizable four years from now.

The PRI can be broken down into three principle groups: the pragmatic revolutionaries, the nationalist leftists, and the political mercenaries.

Pragmatic "Revolutionaries" This group forms a broad cadre from which the government bureaucracy draws much of its top leadership. They emphasize national development and sovereignty, and will accept any combination of routes toward those ends. Although generally pro-State, they accept, and have a reasonable working relationship with the private sector. Nor does their nationalism prevent them from accepting foreign capital where it is needed. These leaders consider it a compliment to be regarded "anti-imperialist" and find it salutary to criticize the United States. But they seek no unnecessary confrontations with U.S. power and bear no grudges against their neighbor to the north which cannot be laid aside in negotiations characterized by give and take and mutual respect. They will resist overly compromising formulas which threaten national independence.

The pragmatic group supports the present attempts at planning out of pride in efforts to improve the State apparatus and its role in promoting development.

In addition, the plans satisfy the strong Mexican cultural need for symbolic achievement. In a sense, the plans are an end in themselves as a crystalization of intelligence, purpose, and humanity. President Lopez Portillo is himself a leading representative of the pragmatic group. Two of his top deputies also fit that description: SPP Minister Miguel de la Madrid Hurtado and Finance Minister David Ibarra Munoz.

Nationalist Leftists. Another important group within the PRI includes those with a more radical approach to Mexican problems. Former President Lazaro Cardenas was the godfather of this faction until his death in 1971. The leftists are of various persuasions and tendencies, but they all share an outrage over the extremes of wealth and poverty which characterize Mexico's economy. They have little faith in the ability of the market to solve the problems of a dualistic, dependent nation. The State, they believe, must be used to reorient development in favor of the rural masses and urban poor. Rather than concentrating on setting up an industry based on foreign consumption models, they favor investments oriented toward satisfying basic needs. The nationalist left does not favor foreign capital and technology. While denying that they propose autarky, this group proposes an inherently more inward-looking development model. Dependency should be combated while self-sufficiency should be promoted on as many fronts as possible. Favoring as they do heavy State intervention to bring about structural reforms, nationalist leftists accept higher levels of inflation. Other chief targets, given the opportunity, would be to nationalize the pharmaceutical and food processing industries and increase social expenditures. 81/

Political Mercenaries. This category includes all those who identify themselves with the prevailing political wind, but who are quite prepared to turn 160 degrees, if not a full 180 degrees, when the moment arrives. When elevated to a high position, they begin to show their own colors -- some of which may cause surprises. Any administration which comes to power must be able to draw on the support of and recruit from prominent strata of this group of Party members.

D. Forecast

Mexico's next administration can be expected to contain representatives from all the three groups described above. If Lopez Portillo chooses De la Madrid

true if Commerce Minister de la Vega Dominguez or Interior Minister Olivares Santana are chosen. But, on the basis of past experience, Mexico's government is likely to oscillate between two tendencies with respect to economic policy and relations with the United States:

1. A continuation of present policies and strategies: nationalist sentiment, tempered by a desire to strike a practical deal (on bilateral trade agreements or eventual entry into the GATT, for instance); avoidance of excessive oil exports, but an open door to capital and technology from diverse foreign sources.
2. A continuation of present policies and strategies, but greater efforts to limit the role of foreign capital and efforts to put curbs on the private sector at large. A drop in the flow of new direct foreign investments and a less vigorous effort to achieve integration with the world economy.

In either case, the response in the United States -- both in terms of overall economic recovery and diplomatic initiatives -- will be an all-important independent variable in the framework of U.S.-Mexican relations. Style will matter as much as substance in the face of the many long-term and intractable problems with which both must deal.

Domestically, the forces of continuity will be manifest in the continued industrialization drive, the use of incentives to promote decentralization and diversification, and the desire to avoid "petrolizing" the economy. Manufactured export growth will remain a goal and Mexico will be prepared to bargain to achieve that end. Mexico will want to diversify its trading partners and will probably make reasonable strides along those lines with Japan and Western Europe, but will continue to trade primarily with the United States. Although employment opportunities will increase at home, many Mexican laborers will continue to seek relief from rural poverty by migrating to the United States for years to come. As one critic remarks sardonically about the projections of the Global Plan, "There will be poverty, but less; there will be rural crisis, but less; there will be unemployment, but less; inflation, but less. There will be, in synthesis, crisis, but less." 82/

CHAPTER TWO
INDUSTRIAL SECTORS

PETROLEUM

I. HISTORY OF PETROLEUM IN MEXICO

A. Overview

During the 1970s oil acquired a level of political significance the historical equivalent of which may be found only in gold during the European Age of Exploration. And like the Iberian nations that found their social fabric rent by the wealth their conquistadores brought home, today's major oil producing nations are discovering their petroleum riches are a mixed blessing. Mexico is among these nations most conscious of the power of oil both to build and destroy.

Americans, however, who once possessed the world's most productive oil industry are suddenly confronted with a new reality of petroleum scarcity and value. A substance that only recently was so cheap that its cost was among the least important items in industrial cost accounts, has become the international synonym for wealth and power. It is somewhat ironic that their gaze would turn south toward Mexico. Mexico has always endowed its considerable -- and now apparently vast -- oil resources with deep political and nationalistic significance. For Mexico, oil has come to symbolize the spirit and success of the 1910 Revolution. The Revolution is the fundamental fact of political life in Mexico. Mexican and U.S. policy makers stumble into historical minefields of misunderstanding and hostility that are far more subtle and complex than their technical discussions when they seek to develop long range energy relationships between the two nations. This section will consequently emphasize history as a basis for understanding Mexico's energy decisions before reviewing and briefly analyzing the status of Mexico's energy industry.

B. Mexico's Energy History: The Pre-Revolutionary Period

When Spain's colonial administrators left Mexico following Independence in 1821, they left behind not only a language and culture but also a legal system

that simply assumed that natural resources were the property of the sovereign. The Spanish Mineral Law for New Spain codified by Charles III in 1783 was clear in reserving title to minerals and "Juices of the Earth" (i.e. petroleum) to the Monarch. He alone had the authority to allow exploitation of subsoil resources.

Following Independence the Mexican state acquired all the rights previously held by the Crown, including the right of ownership over natural resources including petroleum.

During the colonial period and until well into the fourth quarter of the 19th Century the concept of private ownership and control of resources lay outside the basic assumptions of Mexican law. Private ownership of natural resources, if considered at all, was dismissed as a foreign concept rooted in Anglo-American law.

The 30-year long dictatorship of Porfirio Diaz from 1876 to 1911 introduced numerous foreign concepts of business in order to attract foreign investment in Mexico. Among them were a series of four mining laws, amending the Constitution of Mexico and fundamentally altering the traditional patterns of resource development in the country. The laws for the first time permitted foreign ownership and exploitation for export of subsoil resources including oil. The mining law of 1884, declared oil the exclusive property of the landowner; the law of 1882 permitted landowners to exploit hydrocarbons without government permission; the laws of 1901 and 1909 reaffirmed these rights for private landowners.

These laws were significant departures from Mexico's historical approach to resource ownership and development and stirred considerable resentment at their promulgation. The revolutionaries who overthrew the Porfiriato viewed the mining laws as fundamentally illegal in purporting to authorize private ownership of national resources. Among the major goals of the Revolution was reestablishing the state as the owner of Mexico's natural resources.

Readers who wish further information on Mexican energy should refer to "Mexico's Petroleum and U.S. Policy: Implications for the 1980s," Rand, 1980, a consistently accurate and thorough review of Mexico's energy from which this historical summary is drawn with gratitude to the Rand authors David Ronfeldt, Richard Nehring and Arturo Gandara.

C. The Post Revolutionary Period

Article 27 of the Constitution of 1917 -- still in force -- reaffirms Mexican national ownership of minerals including petroleum. Only Mexican citizens may obtain concession rights under this article, and foreign companies are barred unless they accept the jurisdiction of the Mexican law and agree not to invoke the protection of their own governments.

Between 1920 and 1938 successive Mexican governments confronted the conflicting requirements of economics and politics which called for development of the country's natural resources while enforcing national sovereignty and rejecting foreign influence. As the Revolution was consolidated and the central Government developed strength, the emphasis moved away from development accomplished with any increase in foreign influence. During the 1920s U.S., Dutch and British oil companies continued to produce and made Mexico the world's leading oil exporter. Production by these companies was accompanied by their insistence that they actually owned the resource. These assertions were generally upheld by a 1921 Mexican Supreme Court decision that affirmed pre-1917 ownership rights with some qualifications and the 1923 Bucarelli Conferences which resolved some issues relating to claims.

However, in 1925 the Mexican government promulgated a Petroleum Code that limited present holding to 50 years and ended the perpetual grants issued before 1917. Concession holders remained in possession, but possession was no longer unlimited. Under pressure from the U.S. government and the oil companies, the Mexican government relaxed its stand somewhat and reaffirmed the pre-1917 concessions in the Calles-Morrow agreements of 1928.

For the next ten years the relationship between the oil companies and the Mexican government was increasingly tense as Mexico sought to enforce its Constitution, particularly in the area of labor under Article 123, and the companies continued to assert their position of semi-sovereignty.

In 1938, well after the peak of Mexican oil production, and after several years of increasingly bitter confrontations between the companies and the government, largely over labor organization in the oil industry, the government moved to nationalize the

foreign oil holdings. In the words of one American historian, "The Mexicans wanted to establish beyond a doubt the political independence and sovereignty of the country by ending the interference of powerful foreign companies in internal political affairs. 1/

Because the nationalization of foreign oil company holdings in Mexico represented a successful encounter with a foreign "enemy," the issue of that encounter PEMEX -- Petroleos Mexicanos, the Mexican National Oil Company -- has a unique symbolic inheritance and plays a unique role in Mexican national life. And oil, which is what PEMEX represents, carries domestic political meaning far greater than any economic or energy value it might have.

The failure to recognize this political loading may have contributed significantly to several recent failures to reach important energy agreements between the United States and Mexico. For Americans oil tends to be a commodity with economic value. For Mexicans oil tends to symbolize the strength and independence of the Mexican State.

D. Recent History

In 1948, then PEMEX Director-General Antonio Bermudez sought loans from the U.S. government totaling as much as \$475 million for capital development. Despite a 10-year long boycott by the international oil industry, PEMEX had survived and Bermudez, backed by President Miguel Aleman, felt the time was right to improve the company's performance. PEMEX's limited product mix and poor refinery capacity meant that Mexico was importing some product from the United States -- a violation of the principle of energy independence. So it was with reluctance that PEMEX turned to the United States for loans to improve its production and refinery capacity, in spite of warnings from Mexican nationalists. Ultimately, the United States turned down the request, suggesting instead that Mexico seek loans from the private sector -- the oil companies and banks that had boycotted Mexican oil for 10 years.

Subsequently, the Export-Import Bank did make about \$150 million available to Mexico for other purposes, freeing that amount from Mexico's internal

1/ Powell, The Mexican Petroleum Industry, 1938-1950, U. Cal. Press, 1956, p. 32.

reserves for the oil sector. But the reservoir of bad feelings created by that incident has tainted more recent negotiations and set the tone of expectation for Mexico.

In the mid-1950s PEMEX once again went against the political grain and signed a gas export contract with Texas Eastern Transmission Corporation for 200 million cubic feet per day (200,000 mcf/day). Once again, in language that foreshadowed that used during the negotiations of 1977, critics claimed that PEMEX was exporting the national patrimony. No gas actually left Mexico until 1958.

In 1977, U.S. companies in need of natural gas sought supplies in Mexico at a time when Mexico's new oil discoveries had made that resource particularly sensitive politically. Although an agreement was reached between PEMEX and the U.S. companies, the U.S. Departments of Energy and State, mainly represented by Energy Secretary Schlesinger, raised objections relating to price and control. Meanwhile Mexican nationalists criticized the plan as the first stage in an energy relationship with the United States that could leave the United States feeling it had a proprietary interest in Mexico's petroleum resources. Ultimately, the 1977 negotiations broke down and Mexican President Jose Lopez Portillo announced that natural gas would be used to fuel Mexico's industry instead.

As can be seen, the emerging energy relation between the United States and Mexico, against the backdrop of Mexico's recently confirmed world scale petroleum reserves, is influenced by a history which is extraordinarily powerful.

II. MEXICO'S ENERGY PLANS AND POLICIES TODAY

A. The National Energy Plan

The cornerstone of Mexico's energy policy is preservation of the national patrimony. To be sure, oil drives the Mexican economy and makes all other development possible, but conservation is as significant a force as production in the minds of the leaders of Mexican policy. The conservationist ethic coincides with economic and foreign policy principles in Mexico. As one Mexican banker put it, "We do

not want to be like the Middle East. The conservationist ethic in the United States, as in Mexico, is in Mexico's best interest. We can anticipate circumstances where industrialized countries could send paratroopers to the Middle East because of excessive dependency."

Nationalistic and conservationist principles found a voice in the Mexican Energy Plan announced last November 19. The plan, designed to determine energy production until the year 2000, includes the following features:

- Oil exports would be limited to 1.5 million barrels per day;
- Mexico will not export more than half of its oil to any one country;
- Natural gas exports will be limited to 300 million cubic feet per day;
- Oil will not be produced solely for export. The needs of the domestic economy are primary and exports will be set at just less than half the rate of production.

"The primary objective of the [Energy] Plan is to [encourage] development of the abundant energy resources in order to strengthen, modernize and diversify Mexico's economy," according to section three of the Plan.

B. Reserves and Production

Starting in 1976 the Mexican government, and a variety of private and governmental agencies in other countries, have competed to release and verify estimates of proven, potential and probable oil reserves in a series of newly discovered fields in southeast Mexico and offshore in the Gulf of Mexico.

The figures fluctuated, with official PEMEX figures sometimes reflecting all hydrocarbons and sometimes reflecting only the crude oil component. The influential journal International Currency Review has suggested editorially that, "Mexico's propaganda about its oil wealth has, of course, given the country an excellent credit rating." 2/ While Mexico may not

2/ "International Currency Review," 12:2, May, 1980, p. 127.

have misstated its reserves in order to encourage foreign bankers, as some have suggested, there is no question that reserve estimates vary significantly according to the estimator.

In September, 1980, the Mexican government announced proven hydrocarbon reserves of 60.1 billion barrels (crude oil, natural liquids and gas). That figure is 10 billion barrels above the previously announced figure, in order to accommodate newly brought in reservoirs offshore in the Gulf of Mexico, and well above the September, 1978, level of 20 billion barrels proved. The 1980 figure "will surely increase," President Lopez Portillo told the Mexican Congress.

A 1979 report prepared by the Library of Congress, Congressional Research Service, quotes "experts" as saying that Mexico's "untested but promising geological formations and the profuse productivity of present oil wells" could leave Mexico with "over 100 billion barrels of oil reserves...[a figure that] would be surpassed only by the 170 billion barrels of proven reserves attributed to Saudi Arabia." 3/

The authors of the Rand Corporation study who are somewhat less optimistic than Mexican government officials, note that the reserves discussion has been tarnished by "[t]wo misunderstandings": the indistinguishability of total hydrocarbon resources and crude oil reserves (noted above) and "the failure to distinguish carefully among proved, probable and potential reserves." (emphasis in original). 4/

The Rand authors suggest, further, that the pace of the increase in Mexico's petroleum reserves "appears to have been determined more by internal political considerations than by the pace of exploration and development." They point to the slow increase in reserves during the early and mid-1970s despite extensive exploration. By 1978, two years after President Lopez Portillo took office, estimates were increasing rapidly.

"Both the rapid changes and the composition of the changes in reserve estimates in the past four years suggest that the estimates of current reserves

3/ Pagliano, Gary, Congressional Research Service for the Joint Economic Committee, IB 79015, April, 1979.

4/ "Mexico's Petroleum and U.S. Policy: Implications for the 1980s," Rand Corporation, Santa Monica, Ca., 1980.

are not necessarily a good indicator of Mexico's ultimate petroleum potential, and that a careful evaluation of the geological, engineering and political factors behind the increases is essential." 5/

The Rand authors conclude that Mexico is "very likely" to have recoverable liquid petroleum resources in the range of 69-121 billion barrels which could support intensive production in the 5-7 million barrel per day range for about a generation and provide long-term national self-sufficiency for Mexico in the range of 3.5 million bpd or less.

Beyond a certain point, the debate over Mexico's energy resources becomes sterile. It may be enough to conclude that Mexico's oil and gas reserves are at least sufficient to give Mexico a significant if not leading role in world energy matters, should she decide to take the part.

Ultimately, the recovery of Mexico's petro-resources will be governed by two potentially disharmonious factors: world petroleum market prices and Mexico's domestic need either for oil or foreign exchange.

C. Refinery Capacity

The oil industry that Mexico nationalized in 1938 was largely a crude oil export operation designed by foreign companies that wished to refine their crude in other locations closer to markets and further away from Mexico's unstable politics. Capital that could be left safely north of the border or in Europe was so left. Investment in Mexico was confined to production, something that was specific to Mexico.

This meant that Mexico took over something less than a complete oil industry in 1938. It was an industry geared to filling the needs of consumers in the United States and Europe, not Mexico. Ten years after nationalization the American oil companies that were still boycotting Mexico's crude oil were also the source of Mexico's specialty products such as petrochemicals and other even more mundane refinery products. The 1948 loan squabble emerged from Mexico's desire to improve its refinery capacity.

5/ Ibid, p. 6.

PEMEX has sought to become an integrated oil company able to supply the needs of Mexican residential, industrial, agricultural, and commercial consumers. Present refinery capacity is a little over 1 million bpd with expansion and construction projected to reach 1.7 million bpd capacity by 1982. Over the past two years PEMEX has invested about \$950 million in refinery construction with annual investment of about \$1 billion projected for 1980 and 1981.

As Mexico's southeast onshore and offshore fields are developed, the nation is confronted with the need to develop either a crude oil transportation system or a product system to link the fields with the country's industrial heartlands around Mexico City and in the northern states of Nuevo Leon and Sonora.

Mexico is producing two distinct grades of oil, Isthmus with an API gravity in the range of 33° and Maya, 22.1° API gravity. The Isthmus oil, relatively light, low sulphur and relatively free of heavy metals, sells well on the international market and bring premium prices. The Maya crudes are heavy, high in sulphur and high in metals. Normally, such crudes would provide a high proportion of the heavy oils collectively known as "residual oil" that are used as industrial and maritime boiler fuels. However, Mexico's decision in 1977 to minimize the export of natural gas (see history, above) and to focus the use of gas as an industrial boiler fuel left the country with two economic sources of heavy industrial fuels, gas and residual oil, but no really good source of distillates and other light fuels.

The PEMEX refinery construction program has concentrated on the erection of Mexican designed refining equipment intended to produce a distillate: residual ratio of about 60:30 with the balance falling out as asphalt, coke and plant fuel from the heavy Maya crude. If the processes are as successful as preliminary runs indicate, PEMEX intends to push as much as 30 percent Maya crude into the refinery stream within the next year. In early 1980 the figure was slightly less than 25 percent out of a total refinery stream of about 1.1 million bpd.

To construct refineries -- and to install production capacity -- PEMEX issued a total of 65,000 purchase orders and requisitions valued at about \$2 billion in 1979. More than half of these purchases came from foreign suppliers and of those more than two thirds came from the United States. During the period 1979-1986, PEMEX anticipates the importation of more than \$8 billion worth of equipment (at 1978 prices).

Previous projections by PEMEX have been conservative, and there is reason to believe that these projections may be low as well.

If current projections of refinery construction are accurate, Mexico will reach a refinery capacity of 1.7 million bpd in 1982 at about the same time that oil production is intended to peak at 2.75 million bpd. If the Energy Plan is adhered to, this means that Mexico will be self-sufficient in refined products produced from an increasingly heavy mix of Maya to Isthmus oils. The balance of Mexican production, a mix that is increasingly heavy on desirable Isthmus crude, will go towards export.

Based on Mexico's projected refinery capacity of 1.7 million bpd and a petroleum export ceiling of 1.5 million bpd, total production is not likely to rise above approximately 3.2 million bpd, unless the policy of limiting exports to 50 percent of total production is abandoned. However, a 1.7 million bpd refined output is an optimal figure based on operations near rated refinery capacity -- an unusual circumstance under the best of conditions with the highest quality oils. It is not being overly pessimistic or overly critical to believe that Mexico's crude oil production will be lower, on the average, than 3.2 million bpd as refinery capacity fluctuates. Since exports will also change as the Mexican refineries increase capacity and operate with normal fluctuations.

D. Production and the Economy

Mexico's Energy Plan keys oil production to internal development needs. The object is to provide both enough oil and oil products to satisfy domestic demand and enough foreign exchange to provide capital for the country's industrial development. It would be relatively easy for Mexico to embark on a program of maximum petroleum production, turning oil into cash as quickly as possible; an output of 7 million bpd or more is technically feasible. But Mexico would be unable to absorb that amount of oil regardless of the speed with which it developed industry of every description, even assuming a first class port and transportation system. Likewise, the income accruing from crude export levels of 4 million bpd or more would be too massive to be administered properly. We will examine in more detail the dangers of "petrolization" in Chapter III, which concerns constraints operating on the economy.

E. Mexico and the Natural Gas Market in the United States

Mexico's sales of natural gas to the United States are comparatively small today, 300 mmcft per day or less than one-half percent of U.S. consumption (just under 20 trillion cubic feet in 1980). As matters turned out, the gas which the United States failed to receive from as a result of the failed negotiations of 1977 has not been needed in the U.S. market. Almost immediately thereafter the market developed a "bubble," or temporary surplus, which has grown into a condition of surplus that could last for years.

How much gas the United States will need from Mexico in the 1980s is not clear, even assuming Mexico wished to sell more than it does at present. One important study by the Department of Energy, Reducing Oil Vulnerability, suggests that the United States could use 1-2 TCF of Mexican gas a year by 1990. The American Gas Association, in an October, 1980, report suggests the United States could use as much as .5 TCF in 1985, 1 TCF in 1990 and 2 TCF in the year 2000. It indicates that Mexico may eventually have resources of 400 TCF or about 40 percent of the potential of 1,000 TCF the AGA believes exists in the United States. Other analysts use much lower figures for how much gas the United States will need, not out of skepticism about the Mexican reserve but out of a willingness to accept Mexico at its word that it does not wish to sell more gas to the United States.

It seems unlikely that the United States will have to come to Mexico seeking additional natural gas in the near future. Instead it will be able to wait until Mexico wishes to make additional sales. To be sure, Mexican gas could be used to back out OPEC -- or for that matter Mexican -- oil but the United States has a number of options available to increase both demand (by burning more gas under utility and industrial boilers, for example) and supply (full or practical decontrol; completion of the Alaska Gas Pipeline). Until it has sorted out its own needs, it seems unlikely the U.S. government will need to bargain with Mexico.

Mexican gas currently tracks the pace-setting price of imported Canadian gas (\$4.94 per mcf on March 1, 1981) and is consequently selling to a consortium of pipelines at a price well above the average price in the United States. Pipelines in the Southwest with

supplies of old, price-controlled gas can "roll in" Mexican gas, thus averaging out high and low priced gas to reach a price the market will bear. They would be willing to buy additional gas from Mexico. However, no one is able to predict what price the market will bear when decontrol of natural gas takes place in the United States. There appears little likelihood gas imports from Mexico will increase until the United States establishes a new regime for natural gas or accepts the existing decontrol schedule. Moreover, while Mexican gas can be easily accommodated today by a pipeline with adequate supplies of old gas, partial or complete decontrol of old gas would tend to make additional supplies of Mexican gas uneconomic, if not immediately after decontrol, then at the time the market settles into a pattern. Because of transportation costs, because gas cannot be stored easily, and because of historic uncertainties about availability of gas, most experts expect gas prices to track below oil. All of these factors encourage a wait-and-see mentality in the United States which coincides with Mexico's decision to use its gas for industry at home.

STEEL INDUSTRY

I. INDUSTRY STRUCTURE

A. Major Participants

There are five major steel-makers in Mexico, as well as 26 semi-integrated producers and about 40 rerollers. Three of the "Big Five" are government owned and operated: Altos Hornos de Mexico S.A., Fundidora Monterrey S.A., and Siderurgica Lazaro Cardenas - Las Truchas S.A. Sidermex S.A. de CV, a government entity, coordinates their activities.

Altos Hornos (AHMSA), founded in 1942 as a private company but taken over by the government a few years later, is Mexico's largest steel-maker, employing 23,700 people. Headquartered in Monclova, Coahuila, where its two main plants (connected by road and rail) are located, AHMSA also operates smaller plants near Mexico City and on the border in Piedras Negras, Coahuila.

Fundidora is Mexico's oldest and third largest integrated steel-maker. Located at Monterrey, where it operates two plants, Fundidora employs 9,000 people, including 7,000 blue-collar workers. Until recently a privately-run firm, Fundidora is now estimated to be 50-75 percent government owned.

Siderurgica Lazaro Cardenas (Sicartsa), Mexico's newest integrated steel firm, is expected to become the largest. Located in the newly christened city of Lazaro Cardenas, Michoacan, Sicartsa currently operates one plant and employs 5,000 people, of whom 4,500 are blue-collar workers.

Mexico's two major private steel-makers are Hojolata y Lamina S.A. (Hylsa) and Tubos de Acero de Mexico S.A. (TAMSA). Hylsa, the larger of the two, is the steel division of the Alfa Industrial Group, the largest privately owned company in Mexico. Headquartered in Monterrey, Hylsa operates three plants, one each in Monterrey, Puebla and Apodaca, and employs nearly 10,000 people. HYMAX, a separate subdivision of Alfa Steel, operates several plants producing specialty items, including the recently acquired La Florida S.A., the country's second largest galvanized

sheet producer, and Altex, a specialty steel producer now under construction. A third subdivision of Alfa Steel, HyL, developed the direct reduction process that bears its name.

TAMSA is the smallest of the "Big Five." Headquartered in Mexico City, TAMSA operates one plant in Tejeria, City of Veracruz, and employs 5,000 people.

Other noteworthy firms include Mexinox, a French-Mexican joint venture and the country's first integrated stainless steel-maker, and Pre-Reducidas Mexicanos S.A., a consortium of 10 semi-integrated producers building a DRI (directly reduced iron) plant at Tampico.

B. Manufacturing Activities

Mexico is Latin America's second largest steel producer, outpaced only by Brazil. Mexican steel plants range in size from AHMSA's 3.3 million metric tons per year (mtpy) to only a fraction of that tonnage for the smallest ones. The plants utilize largely traditional techniques and the Mexican steel industry produces a full range of flat and non-flat finished goods, as well as pipe, wire, galvanized sheet and tin plate - virtually all for the internal market.

After several "down" years, the Mexican steel industry took off in 1978, stimulated by a surge in domestic demand. Although operating at only 76 percent capacity, total crude steel output jumped by about 20 percent, from 5.6 million to 6.8 million mt (metric tons). The same was true in all major product lines. For example, pig iron and sponge iron production grew by 16.5 and 23.3 percent, respectively, to 3.5 million and 1.6 million mt, while in the finished goods category flats grew by 27 percent and non-flats by 18 percent.

Growth slowed in 1979, due to production and transportation problems, with sponge iron in particular showing a downward trend of 7.7 percent. Total crude steel output grew by only 3.9 percent, to about 7.1 million mt, with capacity utilization slipping to 73 percent. Non-flat goods, stimulated by growth in the construction industry, registered significant gains, notably 13 percent growth in structural shapes, and 15 percent in commercial shapes. The overall growth rate in this sector was 11.9 percent. Flats

also did well, increasing by 8.7 percent, while pipe production remained constant, with all mills operating at 100 percent capacity.

As the figures for pig iron and sponge iron production would tend to indicate, Mexico's major steel-makers currently rely primarily on blast furnaces fed with iron ore and coke from coal to produce steel grade iron, although one firm, Hylsa, has pioneered the development and use of direct reduction techniques. Electric arc and basic oxygen furnaces (BOF's) now account for about 80 percent of total Mexican crude steel production, and it is estimated that use of the less efficient open hearth method will cease completely by 1990.

What follows is a more detailed description of Mexican steel manufacturing activities, on a firm-by-firm basis:

- Government Firms: The three Sidermex-run firms accounted for 59 percent of total crude steel output in 1979. Utilizing traditional techniques -- blast furnaces and basic oxygen furnaces -- the three produced 4.5 million mt, a 12 percent increase over 1978.

Altos Hornos (AHMSA) is Mexico's leading steel-maker. While it operated at only 50 percent capacity during most of 1979 due to strikes and equipment shortages, AHMSA nonetheless managed to produce 2.5 million mt in 1979, a 4 percent increase over the previous year. AHMSA ships a monthly average of 175,000 mt of such finished products as plate, hot and cold rolled sheet, tin plate, structural shapes, wire rod and bars. About 3 percent is exported.

AHMSA installed its first BOF (basic oxygen furnace) in 1971. A major expansion in 1975-77 added a second plant, which included 95 coke ovens, a 4,500 mtpy blast furnace and a new one-vessel BOF.

Fundidora, another Sidermex-run firm, is Mexico's leading supplier of flat-rolled steel, including 150,000 mtpy of steel plate, which is in high demand. The firm was again beset by strikes and technical problems in 1979, causing production to fall by 6.4 percent, from 950,000 to 888,000 mt.

The third and most recent stage of Fundidora's development drove the firm halfway to its goal of a 3 million mtpy capacity. In the process it replaced the firm's open hearth operations with BOF technology,

improved its blast furnace operations, modified its mills to include flat-rolled outputs and abandoned unprofitable operations, so that by early 1979 Fundidora was probably the best equipped steel company in Mexico.

Sicartsa, the newest government-run firm, at this stage is still under construction, although limited production is occurring. A showcase project, when completed, it will be among the world's largest and most modern integrated steel operations. Delays, however, have already crept into the planning process, so the projected 10 million mtpy operation at present only has a 1.2 million mtpy capacity. Current output includes reinforced bars, wire rods and structurals.

A seemingly conventional plant with coke ovens, a blast furnace and two BOF's, Sicartsa is a veritable United Nations of equipment: the coke plant's oven batteries are Japanese; the blast furnace is Italian; the two BOF vessels are Austrian; a lime kiln, iron ore pelletizing plant and one rolling mill are German; an oxygen plant and a second rolling mill are British; and the billet casters are Canadian.

- Hylsa is Mexico's largest private steel-maker. It enjoyed its best year ever in 1979. Raw steel output exceeded 1.5 million mt, an 8 percent increase over 1978. More than 1.3 million mt were sold, accounting for 26 percent of Mexico's flat steel products, and 27 percent of its non-flats.

Hylsa bases its output on five direct reduction facilities and twelve electric furnaces. At Monterrey, seven electric furnaces, operating 75 percent on directly reduced iron (DRI), produced 915,000 tons of plate, hot and cold rolled sheet and tubular goods in 1979. At Puebla, three electric furnaces operating 80 percent on direct reduction technology produced 630,000 tons of raw steel, which was then cast into billets for reinforced bars and wire rod. At Apodaca, two electric furnaces burning scrap produce 85,000 mtpy.

Recent additions to improve efficiency include a new continuous cold mill to replace labor intensive reversing mills, and a computer-run conveyor for continuous feeding of direct reduction output to the Monterrey melt shop, eliminating rail transportation of iron pellets.

- TAMSA is Mexico's sole producer of seamless steel pipe and enjoyed its best year ever in 1979.

Operating at 97 percent capacity, TAMSA produced 420,000 tons of raw steel, of which 255,000 was converted into pipe and 35,000 into specialty bars. More than 80 percent of TAMSA's sales went to PEMEX -- the government oil and gas company. Three percent was exported, mostly to the United States.

TAMSA operates a 350,000 mtpy direct reduction plant (based on HyL technology) and four 50 ton electric furnaces.

- The Mexican semi-integrated firms have a capacity of about 1.7 million metric tons. Mexico's twenty-six semi-integrated steel-makers accounted for 18.5 percent of total output in 1979. Aceros Nacionales S.A. is the largest of these firms, with an annual capacity of 200,000 mt.

The semi-integrated firms have traditionally based their production on the use of recycled scrap and electric furnaces. Recently, however, ten of the largest among them formed a consortium, Pre-Reducidas Mexicanos S.A., in order to build a 750,000 mtpy direct reduction facility that would assure them adequate iron supplies. The plant, to be located at Tampico on the Gulf of Mexico, will utilize HyL direct reduction technology.

- Mexinox was Mexico's first integrated stainless steel plant, located at San Luis Potosi and completed in 1978. Mexinox, operating with technology supplied by the French firm Pechine Ugine Kohlmann, has a production capacity of 40,000 mtpy.

C. Raw Material Supply

Most experts agree that Mexico has vast oil reserves, but estimates of reserves of iron ore and coal, the staples of the steel industry, vary widely. Mexico's iron deposits, located in the north in the states of Durango, Coahuila, Chihuahua, Jalisco and Michoacan, are estimated at anywhere from 170 to over 500 million metric tons, depending on the source -- enough to last for 10 to 30 years. Estimates of Mexico's coal reserves, located at Coahuila, Sonora and Oaxaca, range from 500 million to 1.3 billion tons, enough to last for 35 to 100 years. The fixed carbon content of the coal is poor, however, making it a poor coke oven feed. Another problem is transportation and the economics of shipping bulky raw materials on an already over-loaded and inefficient rail

system (see below).

Some of Mexico's steel-makers are better supplied with raw materials than others. AHMSA, for instance, which is rich in coal but poor in iron ore, has been exchanging coal for iron ore with Fundidora, since the two were brought together under common Sidermex management. Sicartsa, on the other hand, relies on local limestone and ore deposits, but imports much of its coal.

Scrap, which the semi-integrated producers use instead of ore and coal, and which Hylsa, in particular, also uses, is in relatively short supply but should become increasingly available over time. Scrap imports increased by 6 percent in 1979 to 500,000, after having increased by 48 percent in 1978. Mexico's electric furnaces consume 3.2 million tons of scrap per year, most of which comes from Veracruz and Mexico City.

Spurred by the Alliance for Production, initiated by President Lopez Portillo, Mexico's private sector agreed to invest \$2.2 billion in mineral exploration. AHMSA, meanwhile, is spending \$200 million on mining exploration.

D. Marketing

The main markets for Mexico's steel industry are Mexico City, Monterrey and Guadalajara. The industry's main customers include the petroleum, petrochemical, construction, automotive and other manufacturing industries, the national railway, the federal electricity commission, and fabricators of metal drums, nails, wire mesh and aerosol cans.

E. Transportation

Transportation is the number one headache for the Mexican steel industry. Bogged down by years of mismanagement and neglect, Mexico's transportation system simply cannot pull its weight. The rail system lacks locomotives and has only 25,000 freight cars where 100,000 are needed. In the entire country there are only slightly more than 30 berths to accommodate sea-going vessels, with the result that many of these ships must wait up to ninety days to unload.

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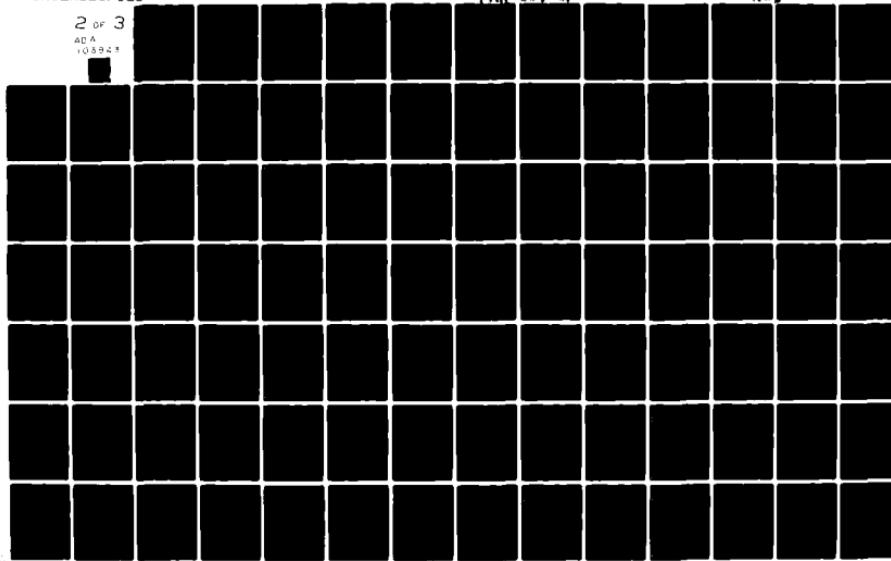
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The transportation system is so poor that it sometimes pays to import raw materials through accessible international routes, rather than move them within Mexico. Indeed, 130,000 metric tons of iron ore were imported in 1978 due to insufficient rail facilities. And, in Sicartsa's case, rather than transport coal overland to Las Truchas, it is imported from the United States and Canada.

As Mexico's industrial development proceeds, its entire transportation system is bound to be subjected to further strain. Fortunately, programs are underway to modernize port facilities at Tampico and Coatzacoalcos on the Gulf of Mexico and at Salina Cruz and Lazaro Cardenas on the Pacific. AHMSA is taking no chances, however, and is building a 250 mile iron ore conveyor from its mines to its Monclova plant.

F. Management

Hylsa, the prime subsidiary of Alfa Industries, and TAMSA have reputations for solid management. The management of the former, for example, has studied U.S. and Japanese management methods, learning to assign the best workers to the most important jobs, encourage their input and make them feel good about their work, while at the same time providing good pay and working conditions. As a result, Hylsa has never lost a day to strikes.

The publicly-owned firms, on the other hand, have a reputation for mismanagement and labor unrest. Fundidora, in particular, has been plagued by strikes, suffering back-to-back 50 day walkouts in 1977 and 1978. More recently, since their sales, planning and financial activities have been coordinated by Sidermex, the public firms appear to have fared better. Sidermex reports that worker productivity increased by 25 percent in 1979.

G. Imports and Exports

Prior to last year, Mexican steel exports had been increasing and imports decreasing. In fact, more steel products were exported in 1978 than at any other time in Mexican history -- 433,000 tons, a 51 percent increase over 1977 -- providing \$131 million in foreign exchange. But with the surge in domestic demand in 1979, the trend was reversed -- imports rose

and exports fell. As the gap between Mexican supply and demand widens, this new trend will continue, unless and until Mexican producers can expand their output. With 1990 demand estimated at 26-28 million metric tons, the industry will have to expand three-fold just to keep pace.

The main culprits, so far as the trade balance in 1979 was concerned, were the automotive and petroleum industries. Total flat (sheet and plate) steel imports increased by 7 percent to 476,000 mt, with no relief in sight due to the continuing growth in the automotive industry. Meanwhile, steel imports for pipeline construction continued to skyrocket, and non-flat imports nearly doubled. Total steel imports reached 1.7 million mt in 1979, while exports fell to around 400,000 mt.

H. Prices and Profits

Mexican steel prices have been controlled since 1956. Nonetheless, during the 1960's Mexican prices were roughly compatible with international prices. Now, however, despite a 19 percent increase in January, 1979, prices average about 20 percent below international levels. Mexican plate, for example, is priced 18.5 percent below U.S. plate and 16.5 percent lower than Japanese plate; hot-rolled sheet sells for 7.6 percent less than U.S. sheet and 11.2 percent less than Japanese sheet; and reinforced bar steel is 30 percent below the U.S. price. On the other hand, Mexican prices for cold-rolled sheet and reinforced bar are higher than those charged by the Japanese.

Of the major steel-makers, TAMSA is in perhaps the most difficult position, since nearly all of its output is sold to PEMEX, a government entity which has partial control over steel pricing and prefers low prices as it is a major steel product consumer. On the other hand, TAMSA and the others benefit from controlled prices on gas and electricity. And although some steel-makers claim that prices for their products are too low, most of them seem to be doing well enough.

Three of the "Big Five" turned a profit in 1979, but Fundidora is a longtime money loser (Sicartsa has not started substantial production yet, so that profit figures are irrelevant at this time). Hylsa had its best year ever, with sales of \$507.3 million, while TAMSA recorded a 33.7 percent sales increase. AHMSA, despite operating at only 50 percent capacity much of

the year, earned profits of \$49.6 million. Sicartsa began to turn a profit in 1980, and even Fundidora, after a decade in the red, nearly broke even last year.

II. GOVERNMENT PLANS FOR THE STEEL INDUSTRY

A. Identification of Plans and Policies

The Mexican steel industry is currently in the midst of a major expansion, with Sidermex, the government authority, leading the way. The extent to which this expansion can be said to be the result of government policy is not, however, clear. Admittedly, Mexico's National Industrial Development Plan (NIDP) assigned priority to the steel industry, offering tax credits and financial assistance and calling for a massive 300 percent increase in total capacity from 9.3 to 28 million tons per year by 1990. However, the capacity of the industry had doubled during the six years of the Echeverria administration, before it was declared a national priority, and current expansion plans seem merely to reflect forecasts of future demands.

The government's policy of price controls on oil, electricity and natural gas does, however, have the clear effect of stimulating growth of the steel industry, as well as other industrial sectors. This policy reflects the Mexican Government's stated intent (in the NIDP) to use the country's oil reserves to finance general economic development, not by exporting oil and using the revenues gained to import other things, but by providing fledgling Mexican industries with a comparative advantage in energy costs.

The Mexican Government first signalled its intent to take firmer control of the steel industry's development when President Lopez Portillo called for the complete reorganization of the state-owned sector. Sidermex, the resulting entity, offers joint management in sales, resources and technology, for three of the country's five major steel-makers. For this reason, everything Sidermex does can be considered "government policy."

Sidermex plans to invest \$17.2 billion in the 1980's, thereby increasing production from its current

level of 4.5 million mtpy to 21 million mtpy. Most of this increase is slated to take place at Sicartsa (targeted for a capacity of 10 million mtpy by 1990) and at a new plant, Siderurgica III, to be located at Tampico on the Gulf Coast (with an expected capacity of 5 million mtpy). In a major change of plans, Sidermex has decided to base the expansion of Sicartsa on direct reduction technology and electric furnaces, rather than blast furnaces and basic oxygen furnaces.

Sidermex is also investing \$170 million to increase capacity at AHMSA to 4.25 million metric tons by 1982. Another \$230 million is being invested at Fundidora.

The line between government plans and market forces begins to break down, however, when one considers that Hylsa and TAMSA, Mexico's two integrated private steel-makers, are also expanding. Hylsa's "Project 2000," with an investment of \$707 million over a three-year period, is designed to double the output of flat steel to 1.6 million mtpy at its Monterrey plant. At the same time, Hylsa is building a 250,000 ton direct reduction process plant in Altamira, as part of a joint venture with Japanese investors. TAMSA, meanwhile, plans to invest \$75 million per year through 1985 in order to reach capacity for 1 million tons of pipe. Major new installations include a sponge iron plant, a new pipe mill and three new ovens.

B. Constraints

Mexico's public steel sector must overcome its history of mismanagement if it is to reach its own lofty goals. This is not simply a matter of amending one's ways; there is, unfortunately, an historical legacy to be dealt with. For example, due to poor past planning, AHMSA has too much blast capacity for its basic oxygen furnaces, Fundidora has more rolling than producing capacity, and Sicartsa does not have economical access to sufficient raw materials.

Even if the Mexican steel industry is able to overcome its past problems, it has new ones to face. The transportation problem, for instance, will get worse before it gets better, as railways can hardly be expected to handle the traffic of an expanded steel industry without a massive infusion of funds. (Building new steel capacity near port facilities will help overcome some of this transportation bottleneck).

Within the industry itself, there is a shortage

of engineering talent, and most of the work force has been inadequately trained.

C. Assessment of Plans and Likelihood of Their Realization

A major controversy is raging now in Mexico concerning Sidermex's decision to base the expansion of Sicartsa on direct reduction technology rather than blast furnace technology. Essentially, critics of the steel industry claim that the "real" cost of the electricity and natural gas needed to produce steel by direct reduction negates any other benefits the technology offers. One commentator has calculated that the direct reduction process is four times most costly, in energy terms, than the blast furnace method. Several critics feel that instead of allowing the steel industry to exploit the low price of natural gas, Mexico should sell its natural gas at the higher prices prevailing on the international market and use the money earned to benefit other sectors of the Mexican economy.

This is not just a question concerning the relative merits of the direct reduction process and blast furnace technology; in fact, it is not that at all. For if there ever was a country whose steel industry was well suited for the use of direct reduction, it is Mexico, which is scrap-short, gas-rich, and a pioneer in the use and development of this technology -- all of these factors make Mexico the ideal place for it to take hold. The alternative would be the importation of foreign technology and equipment and an increased dependence on imported coal at a time when Mexico enjoys an abundance of readily available natural energy sources and, hence, an international comparative advantage in energy inputs.

At issue is whether Mexico should have a steel industry at all, and whether Mexico should attempt to use oil revenues to foster economic development. These are questions that the Mexican Government has irreversibly answered in the affirmative. And even if the adversities facing Mexican steel are substantial, the people involved in the industry are determined to improve its long-term viability.

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III. IMPLICATIONS FOR U.S.-MEXICAN TRADE

Mexico is currently importing more U.S. steel products than usual because domestic demand is running so far ahead of supply. As the Mexican steel industry, stimulated by the increased demand, expands it should be able to replace most of these imports and perhaps increase its exports. While the planned growth of the Mexican steel industry should reduce U.S. steel exports to Mexico, at the same time it offers major opportunities for U.S. and other foreign suppliers of machinery and capital goods.

Several firms in the United States have already taken advantage of the increased business opportunities afforded by the growth of the Mexican steel industry. For example, Korf and Fuchs Systems, Inc. is supplying TAMSA with a water-cooled roof and wall system to outfit its new electric furnaces; Dravo Corp. of Pittsburgh, meanwhile, is engineering an \$80 million, 1.5 million mt pellet plant at Muzquiz, Coahuila, for AHMSA; and for foreign markets, Swindell/Dressler is handling HyL technology sales and engineerings services. AHMSA, Fundidora and Hylsa have all been good, long-term customers for the United States.

U.S. firms must offer competitive financing and be willing to transfer technology if they are to win contracts, especially since Mexico is trying to increase its bilateral commercial relations with nations other than the United States. In this regard, the Japanese and certain European governments (German and French, in particular) seem especially interested in accommodating Mexican government efforts to acquire foreign industrial technology and capital in exchange for assured long-term contracts for oil and gas supplies (see below).

IV. MEXICO AND THE WORLD STEEL MARKET

A. Role of Mexican Steel in World Markets

Steel is expected to be in short supply by 1985, with a possible worldwide shortage of as much as 100 million tons. Since the industrially-advanced nations are not expected to increase their steel capacities

before 1983, it may be up to the developing nations to pick up the slack. This would seem to imply a greater world role for Mexico, one of the fastest growing steel producers in the developing world. But the Mexican steel industry will be hard pressed simply to meet domestic demand, riding the tide of the PEMEX oil boom. According to Sidermex Director, General Jorge Leipen Garay, the gap between production and domestic consumption will not be closed in the next five years, and Mexico's primary purpose will be to satisfy national demand.

Even if Mexico were to achieve its ambitious steel expansion goals -- increasing production to 26-28 million metric tons by 1990 -- that level will hardly qualify Mexico for heavyweight status in the world steel market. Global steel production, currently in the range of 650-700 million tons, could reach as much as one billion tons by 1990.

If Mexico is to make any significant impact on world markets, it would appear to be through the exportation of HyL's directly reduced iron (DRI) technology and, perhaps, sponge iron produced by independent direct reduction plants. HyL's DRI technology already represents Mexico's leading technological export, with steel-makers in six countries -- Brazil, Zambia, Indonesia, Venezuela, Iran and Iraq -- having purchased the process. Negotiations are currently underway with 12 other countries, including Spain, Algeria, Libya and Egypt. (One attraction of the DRI process is its relatively low capital outlay costs for reasonably efficient low-volume plants).

The DRI world market exceeded \$1 billion in 1979, with total worldwide production equal to 14.4 million tons. Growth in the 1980's is expected to dwarf past advances, with production reaching 30 million tons by 1985. HyL, the technology subdivision of Alfa Steel, shares this growing market with the Midrex Corporation, a subsidiary of the German firm Korf. Midrex claims a larger number of licensees, but HyL has the more important ones.

In its battle with Midrex for the lion's share of this growing market, HyL has enlisted the help of the world's most respected steel-makers -- the Japanese. HyL supplies the technology, while the Japanese supply the engineering, construction, marketing network and, most importantly, the image. Potential customers found it too difficult to believe that Mexicans could really furnish reliable, advanced manufacturing technology. There is no such worry with the Japanese.

HyL has also helped its cause by improving upon its original technology. HyL II, unveiled in 1979, offers improvements in both process and engineering technology, resulting in considerably reduced energy consumption, lower capital costs, higher thermal efficiency and simpler operation. Also, with the HyL II process, they can offer mini-plants with a 200,000 mtpy capacity or multiple plant arrangements with an annual production of 1 million tons or more.

HyL is also considering the construction of "merchant" DRI plants, whose output would not be tied to any specific steel mill but, rather, would be made available for trading on the world market. Already, HyL ships surplus DRI to its Venezuelan and Indonesian clients.

Moreover, Japanese and East German consortia have recently expressed interest in investing in DRI facilities based in Mexico, utilizing HyL technology, to supply their domestic steel mills. Marketed in this fashion, DRI -- or sponge iron, as the reduced product is called -- could partially replace scrap iron in the world's electric furnaces.

B. Japanese and European Investments in Mexican Steel

Mexico recently declined to join the GATT, preferring instead to try to negotiate bilateral trade "packages" in which guaranteed access to Mexican oil supplies is used as a "carrot" to obtain foreign investment, loans and scarce technology for Mexican industry. Steel is one of the industries that Mexico has tried to promote by such means.

This newest tactic is part of Mexico's overall commercial strategy of freeing itself from excessive dependence on the United States. Currently, the United States provides about 60 percent of Mexico's imports (more than 80 percent of its steel imports) and serves as a market for about 60 percent of its exports.

France and Japan, the two nations outside of the United States with the most extensive commercial ties to Mexico, have been actively negotiating "package" deals with Mexico. Apparently, however, Mexico's asking price has been too high. Japanese trade officials reportedly agreed to increase their stake in joint ventures with Sidermex, in which the Japanese would provide engineering, know-how and financing, but balked at the level of public credits -- \$450 million

-- requested by the Mexicans. The Japanese first offered \$100 million, then doubled their offer before the talks broke down.

Despite failing to conclude trade packages with Mexico, French and Japanese firms have made important investments in the Mexican steel industry. France's Creusot Loire has taken a minority position (40 percent) in a joint venture with AHMSA, while Japan's Kobe Steel recently joined with Sidermex and Nacional Financiera to form a joint venture, Grupo NKS, to produce large diameter pipes. To the extent that these French and Japanese connections flourish, it will come at the expense of imports from the United States.

AUTOMOTIVE INDUSTRY

I. STRUCTURE

A. Overview

The Mexican automobile market is the fastest growing in the world. The rate of growth of the Mexican automotive industry is also one of the highest in the world. In 1979 the industry grew at the rate of 14.5 percent and accounted for 4.6 percent of the Mexican GNP that year. If expected growth is realized the Mexican automotive industry will represent 6.2 percent of the GNP in 1982. In 1979 over 427,500 finished vehicles were made in Mexico, including passenger cars, vans, light and heavy trucks, tractors and buses. Automobile production in the country is expected to double by 1985.

B. Major Participants

In Mexico there are fourteen automotive firms producing automobiles, trucks, tractors, buses and trailers. Of these, six are 100 percent foreign-owned, two have significant foreign participation, two are 100 percent government-owned, and five -- principally producing tractors, buses and trailers -- are owned by Mexican private interests. In effect, eight manufacturers dominate the Mexican automotive industry and are known collectively as the "terminal industry," in reference to the fact that these eight producers comply with the Mexican Government's stringent 1962 Automotive Decree, and thus remain in a market which saw all other major firms drop out. The terminal manufacturers are Chrysler, Ford, General Motors, International Harvester, Nissan, and Volkswagen in the private sector and Diesel Nacional, or DINA (the firm manufactures Renault passenger cars and a broad range of trucks), and Vehiculos Automotores Mexicanos, or VAM (the firms produce American Motors cars and Jeeps and will soon begin production of Renault models), both of which are majority-owned by the Mexican Government. As Ford, Chrysler, GM, Nissan and VW account for approximately 86 percent of the

Mexican automobile and truck market and almost 90 percent of Mexican car and truck production originates from the subsidiaries of these foreign firms, analysis will focus on the activities of these firms.

C. Manufacturing Activities

Oriented as they are toward the relatively small internal market, Mexican-based production facilities are generally of small scale, ranging from one-twentieth to one-fortieth of equivalent U.S., European or Japanese plants. Although capacity utilization is high (all the foreign firms run double shifts in their plants, with DINA and VAM only maintaining one shift), Mexican-based plants do not achieve effective economies of scale. The cost inefficiencies flowing from this lack of scale are compounded by even greater inefficiencies in the various supplier industries. Nevertheless, the significant number of new investments by the foreign firms for production facilities are all for plants with production scales which are internationally competitive. This is particularly true of plants to be used for the manufacture of major "world car" components.* For the remainder of the industry producing for the domestic market, the seven existing automobile firms (and the dozens of models they produce) are certainly excessive for the present size of the Mexican market, and this is an important structural factor contributing to Mexican inefficiency.**

The product and production designs used in the Mexican automotive industry are based on currently available technologies, in large part, but must be adapted to production for the smaller Mexican market. As a result, cost inefficiencies are heightened. Along with these inefficiencies, there have been some difficulties with quality control procedures with particular parts suppliers.

* The "world car" concept being adopted by the major auto firms calls for the specialized manufacture of components and their transfer to a given firm's plants around the world.

** For a discussion of this dimension of inefficiency see Jack Baranson, Automotive Industries in Developing Countries, World Bank Occasional Papers, Number Eight (Johns Hopkins Press, 1969), pp. 28-42 *passim*.

D. Product Output

Roughly forty models of passenger cars, vans and light passenger trucks are produced in Mexico. Chrysler, GM and Ford produce a representative range of automobiles in their compact, medium and luxury lines. VW and Datsun (Nissan) produce compact models in Mexico, as well as one or two van or pickup lines. Under license to the U.S. auto firm AMC, VAM produces several of the American company's car lines. DINA has a similar arrangement with Renault, which complements the French firm's limited exposure in this market.

Total automobile production for an individual firm ranges from VW's 91,593 units in 1979 to Renault's 13,695 units in 1979. Total production of passenger cars and trucks in 1979 was over 427,500 units, a 19 percent increase over 1978 production. (See Table I for breakdown of passenger car models and production figures.) Major investments by foreign firms over the next few years should dramatically increase the volume of output for both passenger cars and light trucks. GM, for example, intends to double its production capacity by 1981. (See section below on Investment Activity.)

E. Investment Activity

In keeping with projections of an average industry growth rate of over 10 percent up to 1985, the Mexican automotive industry is currently witnessing a substantial number of actual or announced investments. Between 1980 and 1983, according to November 1979 projections of the Mexican Automotive Industry Association, new investments in vehicle and auto parts manufacturing will total \$960 million. More recent projections place the investment figure closer to \$2 billion for this period. To indicate the type and scope of investments which are and will be occurring in Mexico, several examples follow:

- Chrysler is now building a \$109 million plant in the state of Coahuila for the production of 4-cylinder engines, with a projected annual output of 200,000 units. Total Chrysler de Mexico investments up to 1982 are set at nearly \$300 million.

- Ford is expanding its existing complex at Cuautitlan near Mexico City so that it can increase car and lorry production by 29 percent. Ford is also

pursuing three large joint investment projects with Mexican partners: in association with Grupo Industrial Alfa, a \$52 million aluminum engine head plant near Monterrey, with Ford having 25 percent equity; another Ford-Alfa joint investment of \$44 million for a new Mexico City plant to produce Ford LTD cars and trucks; and a joint investment with Monterrey's Grupo Vidrio Plano for a new \$44 million plant to manufacture automotive safety glass, in which Ford holds a 38 percent equity position.

- GM is spending over \$160 million to expand its Tolucca facility and \$220 million for a 450,000 units per year engine plant. Additionally, GM has started construction of two large plants at Ramos Arizpe in the state of Coahuila: one will turn out GM's full line of Mexican-made passenger cars and the other will manufacture V-6 automobile engines. Two smaller plants for production of automotive parts will also be built at the Coahuila complex. Total GM investment for the Coahuila complex is expected to be between \$262 million and \$300 million.

- Nissan Mexicana has approved a \$9 million expansion of their present \$59 million manufacturing and distribution complex at Cuernavaca.

- VW has plans to increase its investment in Mexico by \$131 million.

Three points should be made concerning the emerging pattern of new investments in the Mexican automotive industry. First, these new investments are primarily for exports and are the result of the new industrial policies and directions of the Mexican Government (including the 1977 Automotive Decree), as analyzed below. Secondly, these investments for new production facilities are more oriented toward achieving higher cost efficiencies than has previously been the case. Among other things, the realization of scale economies is being given great consideration. This results in increased international competitiveness. Thirdly, investments in new production facilities are made with an eye on the export potential of the resulting products, whether they be to regional markets or intra-company transfers as part of the "world car" concept.

F. The Supplier Industries

In its broadest sense, the Mexican auto parts manufacturing sector can be described as being com-

posed of over 1,500 firms with an extremely wide variety of products. Among the manufacturers there are many small shops, a few large suppliers whose product line-up is primarily in the automotive field, and a host of large and small companies that manufacture items for the automotive industry as specialties within their overall operations. Several large U.S. firms which manufacture automotive parts are also producing in Mexico. Additionally, the major foreign subsidiaries are producing various componentry in-house. Nevertheless, there is a much higher proportion of Mexican equity in the parts industry as opposed to the terminal industry.

The major manufacturers are dependent on outside-plant procurement of parts for over half their components. Yet the list of parts produced in Mexico is extensive, including chassis frames, springs, coils, wheels, cylinder heads, valves, air condition cones, locks and keys, constant velocity joints, electrical equipment and wire harnesses, filters, air brakes, and axles. It is projected that the country's auto parts manufacturers will invest \$1,613 million in new expansion programs in the 1980-1982 period.

The automotive component industry plays an important role in the Mexican economy. The industry provides employment for over one-half million people. Well over 50 percent of the country's foundry capacity produces virtually exclusively for the automotive sector. Perhaps most significantly, the industry serves a critical function in developing the Mexican economic infrastructure.

Yet the auto parts industry also represents a major problem for the Mexican automotive industry as a whole. In certain instances there have been difficulties in the auto parts industry in terms of product quality and production inefficiencies. Mexican components are priced several times higher than comparable products on the international market. In some component categories, and to a larger extent in terms of raw materials, the Mexican supply is insufficient to meet Mexican automobile producers' production demands. There are major supply bottlenecks for tires, crank shafts, transmissions and stamped sheet metal parts, which is adversely affecting the auto industry. As a result, despite a significant level of auto component exports, a severe trade imbalance in auto parts is caused by the very high level of component imports (see section on Imports and Exports below).

G. Marketing Activities

The domestic Mexican automotive market is one of the largest among developing countries and is the fastest growing in the world. Only one in twenty-two Mexicans currently owns a car, and the predominantly young population (approximately 70 million, of which almost one-half is under the age of sixteen) is increasing by 2.9 percent a year. Coupled with the country's increasing oil wealth, the population demographics make Mexico a potentially huge market for automobiles. Yet, at present, the auto market is fairly well restricted to the small, upper-middle class. The current average disposable income level is too low to represent a big auto market. Vehicle registrations are predicted to increase by 10 percent per year, which implies annual sales of 800,000 units domestically by 1985 (see Table II for historic growth and projections of Mexican market).

Marketing activities by automobile firms impacts significantly on those firms' market shares. VW de Mexico, which leads the passenger car market, is generally acknowledged to have the best marketing operation among the terminal manufacturers. Combined with the West German firm's strong industrial and commercial commitment to its Mexican subsidiary, VW de Mexico also has the greatest number of sales outlets and the best distribution network in Mexico.

An examination of Chrysler de Mexico's marketing illustrates the sophistication of marketing in Mexico. Chrysler research had shown that Mexicans like the front end of Chrysler Plymouth's Valiant and the rear of its Dodge Dart. A synthesis of these two cars was designed for the Mexican market and large sales ensued. That success was followed shortly by the skillful marketing of the LeBaron model as Chrysler de Mexico's main luxury car. A slick advertising campaign was launched, aimed at establishing the car's luxury image. The ads depicted LeBaron in luxurious Parisian settings to play on the Franco-philia of wealthy Mexicans. The car became a best seller in a very short time. Adept marketing has been complemented by a company policy adapting the firm's dealer network to the pervasive presence of close family ties in Mexican life. Chrysler encourages fathers who own dealerships to bring their sons into the business. When a family has several sons, as is often the case, Chrysler attempts to accommodate the family by extending the dealership network to provide a place for the other sons.

H. Pricing and Profitability

High prices in the Mexican automotive industry are a result of that industry's unratinalized structure and small market. Additionally, the Mexican Government has set price ceilings for automotive products at a level roughly 50 percent higher than international prices. The cost of local value-added, Mexican-produced components and parts are approximately 2.5 times higher than international costs.

Despite the high price ceilings allowed by the Mexican Government, Mexican automotive firms' profits can only be characterized as adequate. While profit margins are reportedly improving, the return on investment in the auto industry is lower, normally, than the average for the Mexican manufacturing sectors. Current price levels seem to be sufficient for most companies to earn satisfactory returns, but the Mexican Government controlled firms, VAM and DINA, suffered losses in 1979.

I. Imports and Exports

The trade deficit in the automotive industry in 1978 was 28.6 percent of the country's total deficit, and in 1979 it grew to 30.3 percent of the total, or \$616 million. This trade imbalance should remain, at least in the short term, as differences in inflation rates will continue to make Mexican manufacturers less competitive in international markets. The Mexican deficit in this industry is most probably caused by the importation of replacement parts and equipment (although this has not been statistically substantiated). The automakers are much closer to a balance in foreign sales and purchases -- in great part due to government requirements (see section below on Government Policies). If the investments in the new production facilities in Mexico materialize and are successful onstream as planned, this situation could be reversed and Mexico could move to a surplus position in the automotive sector.

In fact, exports of automotive products have been making impressive gains and should continue to do so. In 1979 exports of finished autos jumped by 73 percent in terms of quantity and 99 percent in value, and exports of car components were up by 27 percent in volume and 40 percent in value. Auto exports of all kinds brought in \$924 million in 1979, although this

was offset by a \$616 million deficit of imports of parts and equipment which were needed to produce and service finished units. (See Table III for a two year breakdown and comparison of automotive imports and exports.) The Mexican Government hopes to balance its trade in the automotive sector by 1985 and is aiming for a surplus by 1990.

Over 60 percent of Mexico's automotive exports are componentry and subassemblies. This reflects the fact that the country is increasingly being used by the major foreign firms in the context of their world car corporate strategies. VW is an exception in that it ships a significant number of finished cars to its European markets, and the firm accounts for most of Mexico's finished car exports. The other major international firms use their Mexican plants to provide finished cars to the Mexican market and to supply other plants not based in Mexico with componentry for final assembly. The componentry exports by individual foreign firms bear similarities: while Ford exports engines, aluminum parts, glass and plastic products, brake drums, axles, and standard transmissions to its international network of plants; GM exports engines and wire harnesses, and Chrysler exports engines, aluminum parts, glass and plastic products, and universal joints to its other, non-Mexican plants (Chrysler also exports a limited number of light vans to Central and South America from its Mexican facilities).

II. GOVERNMENT POLICIES

A. Overview of Government Plans

The automotive industry has been targeted by Mexican policy-makers to be a leading sector in the government's attempt to use the country's oil revenue to transform itself into a major industrial power. The Mexican automotive industry is expected to make a significant contribution to the development of the infrastructure, employment generation, and eventually, the earning of foreign exchange.

The Mexican Government's National Industrial Development Plan has targeted a yearly growth rate of 13 percent for the auto parts industry and an 11 percent growth rate for vehicle sales through 1982. By 1990, the Government hopes to reach 15 percent annual

growth. Automotive exports are targeted for expansion at the rate of 25 percent per year at least through 1982. The overall Mexican plan to achieve these growth rates consists of three major policy objectives: 1) integration and rationalization of the domestic industry so as to achieve economies of scale and efficient supplier-production relations; 2) "Mexicanization" of the industry, or increased levels of sourcing and participation by Mexican firms in the industry; and 3) specialization within the international market, producing components and special vehicles for export. Specific policies to achieve these objectives are described below.

B. Description of Policies

The Mexican Government's approach to achieve the goals set for the automobile industry are, essentially, of the "carrot and stick" nature. A national decree concerning the automotive industry serves as the "stick," impelling the industry in the direction of increased Mexicanization and export orientation, while a host of incentives is used as the "carrot" to stimulate rationalization and growth within the industry. Mexican Government policies toward the auto parts industry are, by and large, the same as for the automobile, yet contain several different incentive policies. The full range of government policies concerning the automotive industry is discussed in what follows.

- Decree for the Promotion of the Mexican Automotive Industry. The most current decree governing the automotive industry went into effect in June, 1977. This decree contains, on the whole, the same objectives as the Automotive Decrees of 1962 and 1972, although the policy tools to achieve these objectives have been modified somewhat from decree to decree. The principal objectives of the 1977 Automotive Decree are sixfold: 1) to attain international levels of productivity; 2) to generate a positive foreign exchange balance in the medium-term future; 3) to maximize the incorporation of local content in order to create employment; 4) to substitute imports into the border areas with locally-made products; 5) to optimize the use of raw materials and resources through a higher degree of rationalization of vehicle production; and 6) to recognize the achievements and strengthen the efforts of the Mexican majority-owned companies.

To accomplish these objectives, the 1977 Decree contains fifty-one articles, which are summarized below:

1) An annual foreign exchange budget is to be prepared by each terminal manufacturer in which all company imports as well as other payments abroad are balanced by exports. The budget is based on a given firm's sales and production programs and exports and also on a complex formula which varies from firm to firm in that the formula takes into account each firm's level of local integration and degree of Mexican ownership. Also, in the calculation of imports in the budget, materials imported by suppliers for incorporation into local parts are to be compensated by exports of the terminal manufacturer using these local parts. Individual terminal manufacturers have until 1982 to reach a balance of trade.

2) Minimum and recommended local contents for vehicles are established (minimums: cars, 50 percent; trucks, 65 percent). Should the company not reach the recommended levels (by 1983: cars, 75 percent; trucks, 85 percent), then they will be required to export more.

3) Increased levels of sales in the Mexican market are contingent upon meeting export and local content requirements.

4) Companies with Mexican-majority capital may be authorized to produce vehicles other than those currently in their approved line-ups. Foreign companies must request this approval from the Foreign Investment Commission.

5) Only Mexican-majority capital firms are authorized to produce or install diesel engines as original equipment.

6) Car prices (as distinct from truck prices) are no longer government controlled, but have a very high ceiling.

7) Export incentives, duty exemptions and assembly-tax subsidies are continued, providing balance of payments and local integration objectives are met by a given firm.

In summary, the major thrust of the 1977 Automotive Decree is to force the development of an export-oriented terminal industry. Additionally, the mandates for a substantial increase in local content for Mexican vehicles promotes Mexicanization.

C. Incentives

Incentives provided by the Mexican Government are numerous and extremely liberal. As indicated previously, a major reason for the nature and extent of these incentives is to entice and encourage compliance with the 1977 Decree by the terminal industry. Companies complying with this decree are eligible for the wide range of incentives, which include:

- rebates on taxes and import duties, especially to those companies constructing facilities outside of the congested areas of Mexico City, Monterrey and Guadalajara;
- investment grants for automotive parts plants;
- manufacturers of cars, trucks, tractor-trailers and buses may receive 100 percent duty exemption on imports of new machinery, equipment, raw materials and components not produced in Mexico;
- a variety of locational incentives are offered for constructing new facilities away from congested areas and in priority zones;
- the loosening of price controls.

D. Other Regulations

Other government regulations and policies (or lack of) also serve to stimulate the national automobile industry, and particularly, foreign investment into it. These regulations/policies include:

- virtually no workplace safety or environmental regulations;
- no restrictions on remittance of profits, repatriation of capital, or currency convertibility;
- the "maquiladora" program, which promotes the establishment of in-bond assembly plants within 20 miles of the U.S.-Mexican border.

E. Auto Parts Industry Policies

The Mexican Government has put a somewhat

different focus on its objectives and policies for the auto parts industry, in comparison to those objectives and policies for the automobile industry. While the latter is and should remain dominated by foreign firms, the auto parts industry is essentially nationalized by a law calling for at least 51 percent Mexican participation in any auto parts firm. The government program, put into effect in late 1979, outlines three basic objectives meant to aid auto parts producers in keeping up with booming local demand. They are: 1) consolidated production of existing parts; 2) production of new parts and components; and 3) higher investment, particularly with a view to upgrading product quality and generating employment. Policies to achieve these objectives are laid out in fourteen points. Several of these points derive from the 1977 Automobile Decree, but the majority are available to all manufacturers as part of the National Industrial Development Plan. These include 10 to 15 percent tax credits for new investments in certain areas; 20 percent credit for job creation; 5 percent credit for purchase of Mexican-made machinery; preferential energy pricing incentives; export tax rebates; regulations to block vertical integration by auto producers in product lines already covered by the local parts industry; and increased permission to import used machinery. Supplementing the development program for the auto parts industry is an "action agreement" signed by the Mexican Government and 130 companies which have subscribed to the program so far. The agreement includes a joint pledge to make investments worth \$3.5 billion over a three year period, generating an estimated 30,000 new jobs.

F. Constraints

In the Mexican Government's and automotive industry's efforts to develop and strengthen the industry, several critical constraints must be overcome which are currently inhibiting this industry, particularly in the area of international competitiveness. By far the most significant constraint to the Mexican automotive industry lies in the supplier industries. As discussed earlier (see section on Supplier Industries), the Mexican supplier industries are, in general, characterized by cost inefficiencies, sub-standard quality and parts and raw material bottlenecks. These factors retard expansion by the automobile industry to international scales of production and drastically increase the price of exportable components and finished vehicles. International competitiveness is, therefore, adversely affected.

Additionally, the lack of supply of several critical inputs from local industries results in extremely high imports of these goods, thus creating a trade imbalance. The generally low level of production volumes in both the auto parts and terminal industry is another critical constraint on the development of international competitiveness in the automotive industry.

Three other major constraints bear note. First, labor problems have plagued some companies. Nissan, for example, has had employee relations trouble at its Cuernavaca plant, although it is noted for its excellent work force rapport in Japan. In the last seven years the GM plant in Mexico City has been shut down seven times by strikes, including a four month stoppage in 1980. Additionally, while no hard data is obtainable in this area, the general assumption is that worker productivity in Mexico is much lower than in the United States, although Mexican labor wages are only one-half to one-third those of the U.S. (According to November 1980 Bureau of Labor Statistics figures for the "transportation equipment" industry, wages plus fringe benefits in the United States are \$15.00, as compared to \$4.75 in Mexico. Our information from industry sources indicates that fringe benefits in the "automotive equipment and component" sector, as distinct from the broader category of "transportation equipment" runs closer to \$7.00 in Mexico -- 75 percent fringe, contrasted to near 20 percent used in the BLS calculation). Second, the transportation system acts as a significant constraint. As the railway system is underdeveloped, auto components must be moved domestically by truck for the most part. Production delays occur on occasion as a result. After the 1976 devaluation of the peso, firms were pushed into recession and so did not renew their transport fleets. The current general economic expansion has put a strain on the existing transport fleet and transport bottlenecks therefore occur. Finally, the automotive industry is extremely vulnerable to monetary forces such as currency fluctuations, inflation and credit supply. Adverse movements in those areas severely impact on the industry's sales volumes and international competitiveness.

G. Assessment of Government Plans

Bearing in mind the three principal objectives of the Mexican Government in regard to the automotive industry -- increased levels of Mexicanization, export competitiveness (particularly in componentry), and industry rationalization -- the results to date of Mexican Government policies are mixed. While the level of Mexicanization has increased and exports have increased substantially, imports of intermediate prod-

ucts for the auto industry have increased even more dramatically and the lack of rationalization in the industry remains its number one long-term problem.

Two overriding factors impacting on the industry and effectively beyond the control of the Government deserve mention in assessing government policies in this area. One is that the Government is in the enviable position of regulating an industry intent on capturing a share of the fastest growing auto market in the world. As a result of the projected growth of this market, segments of the Mexican industry may develop into a position of strong international competitiveness, regardless of any government actions taken. The other is that the Mexican industry is dominated by five wholly-owned subsidiaries of foreign multinational corporations whose operations are, in the final analysis, governed as much by the global corporate considerations of the parent company as by considerations of Mexican Government policy.

One area in which government policies have been a clear success has been investment stimulation, if for no other reason than the Government has created a generally favorable business environment in a potentially huge market. Announced investment expansion programs by the Mexican automotive industry total \$2 billion up to 1983 (see previous section on Investments for fuller discussion of these programs). These investments will translate into several positive benefits. Secretary Jose Andres Orteyza of the Ministry of National Properties and Industrial Development predicted in January, 1980, that the increased investment level will boost Mexico's automotive export level to \$4.4 billion (from under \$1 million in 1979) and will create 30,000 new jobs. In fact, employment in the automotive sector increased from 90,000 in 1976 to 120,000 in 1979 due, in great part, to investment activity during that period.

A significant spin-off effect of Mexican policy is manifesting itself in the investment patterns of foreign firms through its effect on traditional component supply patterns of major foreign manufacturers. Nissan's presence in Mexico has resulted in several parts makers affiliated with Nissan Japan locating plants in Mexico. This should serve to strengthen and make more internationally competitive the critical supplier industry.

The foreign automotive firms located in Mexico are conscientiously attempting to meet the import-export requirements set forth in the 1977 Automotive Decree and are structuring their industrial activities around achievement of a trade balance between their

imports and exports. The new investments in componentry plants is one strong indication of these firms' intention to redress the parts import imbalance. These investments are generally for plants to produce easily exportable, high-value items such as engines, and, significantly, these plants are being built at international scales of competitiveness. Nevertheless, the import of componentry is still at a level far above exports for the industry as a whole, and it is projected that the level will increase at a low but constant rate throughout the decade. The key to decreasing these imports lies in making the supplier industries more internationally competitive. While the decree concerning the auto parts makers put into effect in 1979 is a laudable government effort to rectify the situation, the solution is still a long way off and requires a broad and deep strengthening of the infrastructure as a whole.

In regard to Mexicanization, or the increased participation of Mexican firms in the industry, government legislation has been effective. By law, to qualify as an eligible export, a component must contain at least 80 percent local content, some of which will be originating from Mexican-owned firms, and any new auto parts firm must have over 60 percent Mexican equity. Thus Ford has recently entered into four joint ventures with Mexican firms in a minority-equity position for production of automotive components. Additionally, in regard to the mandate of the 1977 Automotive Decree for increased levels of local and/or export content in finished cars and trucks (by 1983: cars, 75 percent; trucks, 85 percent), the terminal industry is making concerted efforts to reach these targets. Nevertheless, Chrysler, for one, does not think it can meet these targets in the required time. More likely, Chrysler will achieve 60 percent local content for cars and between 60 and 70 percent for trucks by 1983.

The most fundamental problem facing the Mexican automotive industry is a lack of rationalization in production, and Mexican Government policies do not effectively address this situation. Industry experts feel that the terminal industry would have to be reduced to three or four firms, with an even more drastic reduction of the number of models produced for economies of scale to be realized. In the auto parts sector there is an even more pressing need for an industry shakedown.

At a time when auto manufacturers in the industrialized countries typically produce over half a

million units of a single related series, the realization in Mexico of an internationally competitive auto industry will require large scale assembly operations of similar proportions using many, if not all, standardized components. In all of Latin America, only Volkswagen's plant in Brazil has reached this level of output and, logically, only Brazilian VW's compete seriously in world markets. Mexico will have the opportunity to achieve world scale production levels for two or three plants in the 1980's if growth prospects for the economy as a whole are realized. To accomplish this, however, the Mexican Government will have to intervene dramatically in the automotive sector to consolidate and rationalize manufacturing operations.

In conclusion, the projection of the Government's National Industrial Development Plan for yearly growth rates in the automotive industry of over 11 percent is probably optimistic, anticipating, as it does, an almost five-fold increase in the value of production output by 1990. A more accurate assessment may be a three-fold increase by 1990. Yet, again, this is contingent on the predicted, but difficult to achieve, compound annual real growth rate for the economy as a whole of 10 percent up to 1990. Imports will probably increase incrementally as projected, but exports will increase slowly too, with a trade balance achieved in the late 1980's. While Mexico is striving to avoid some of the pitfalls that have stalled the auto industries in such countries as Brazil and Argentina where government regulation has been too tight, the need for structural change in the Mexican automotive industry is critical to the realization of an internationally competitive industry, and this change must be induced by stronger government action if positive results are hoped for in the near to intermediate future.

III. MEXICO AND THE UNITED STATES

A. U.S. Firm Presence in the Mexican Industry

An indication of the extent and range of activities of the major U.S. auto manufacturers in the Mexican market has already been given. In summary, the involvement of Ford, Chrysler and GM in this market is

substantial, and these firms' commitment to the market is extremely strong, given the high levels of investments in Mexico each firm has announced. Further indications of this involvement and commitment include:

- GM facilities in Mexico currently can produce 50,000 vehicles and 25,000 engines (4-cylinder, 6-cylinder and V-8) a year. Under construction are plants to build more than 65,000 vehicles and 450,000 newly designed V-6 engines annually. These investments will exceed \$350 million.

- Ford de Mexico has an annual production capacity of 72,000 cars and trucks. New investments will raise this production level to 93,000 over the next few years. The U.S. firm currently has two assembly plants, a casting plant and several other facilities producing a variety of components. The company has announced a \$365 million investment for a 4-cylinder engine production plant.

- Chrysler's operations in Mexico have an annual car and truck production capacity of over 90,000 units. Currently the firm produces over 130,000 engines annually. An investment of \$110 million in a 4-cylinder engine plant will raise annual engine production to 400,000 units by 1984. Total Chrysler investments in Mexico up to 1982 will be \$300 million.

U.S. firms' involvement in Mexico stem from two basic corporate goals: 1) penetration of a potentially huge vehicle market; and 2) internationalization of the production function in line with the world car concept. Mexican Government export requirements fit in nicely with the U.S. firms' world car strategy. A wide variety of automotive componentry produced in Mexico by or for the three major U.S. automakers' subsidiaries is exported either to the parent firms' plants in the United States or to other subsidiaries around the world for final assembly (particularly to other Latin American operations). The Mexican-produced components for international distribution can range from low-technology, high labor-content items such as auto trim, hubcaps and glass, to relatively more sophisticated items such as speed controls and engines. Engines, in fact, appear to be designated by the parent firms to their Mexican subsidiaries as the latter's primary contribution to the given firm's overall world car strategy. For example, close to 80 percent of the output of GM's 450,000 unit engine plant under construction and Chrysler's 200 unit engine plant under construction will be exported to U.S. and Canadian plants for final assembly. As

another example of the world car concept in operation in Mexico, the new Ford Escort being produced in the United States has a door life assembly from Ford de Mexico (as well as eight other components coming from Ford plants in eight other countries).

Perhaps a description of a recent joint venture by Ford de Mexico with a Mexican firm best serves to illustrate some of the major operational considerations confronting the U.S. automakers with subsidiaries in Mexico. These considerations include the world car concept, Mexican equity and export laws, Mexican market penetration, and the imported supply of critical components.

Ford de Mexico recently entered into a joint venture with Valores Industriales, S.A. (VISA), one of Mexico's major private holding companies, to produce plastic automotive products. The \$45.6 million plastics fabricating facility located near Monterrey will be operational by 1982. VISA will maintain a 60 percent equity position and Ford de Mexico a 40 percent position. Plastics products will be exported to U.S. Ford plants. This will contribute to Ford's export requirements both in terms of increasing the import of components and expanding sales in the Mexican market (Ford projects that these plastics exports will allow it to produce and sell about 6,000 additional vehicles a year in Mexico). Ford claims these incremental vehicle sales will, in turn, create about 100 additional jobs in the United States by permitting more parts to be exported to Mexico. (The net effects of losses and gains would have to be determined by a comprehensive sector survey.)

B. U.S. Auto Parts Industry and Mexico

U.S. automakers in Mexico use five major supply sources for components: Mexican-owned auto parts firms; joint venture auto parts firms in Mexico; internal company production sources in Mexico, the United States and elsewhere; U.S. auto parts firms with production sites in Mexico; and the U.S. auto parts industry. In the final analysis, the location of production facilities by a U.S. automaker in a country such as Mexico, which maintains local control and export requirements, will adversely impact on the U.S. auto parts industry. As production of components and final assembly is internationalized by the automotive industry in line with the world car concept, U.S. auto

parts firms are bound to lose previous sales outlets. Some of the major U.S. auto parts firms have responded to this reality by locating production facilities in those countries where the U.S. automakers maintain a manufacturing presence. Thus, a large number of U.S. auto parts firms have production facilities in Mexico, including Goodyear Tire and Rubber Co. (radial tire-making plant), Eaton Corp. (plants for axle housings and engine valves), Dravo Corp. (an iron ore treatment facility), Pratt and Whitney Corp. (interest in an \$80.8 million turbine maintenance plant), General Tire and Rubber Co., Texas Instruments, Inc., Kimberly-Clark Co., Celanese Corp., and Spicer (Dana Corp.).

The number and range of automotive components purchased by the U.S. firm subsidiaries in Mexico from Mexican firms is large and growing. These purchases represent a direct loss to the U.S. auto parts industry. These Mexican company-sourced components include springs, coils, wheels, cylinder heads, valves, air conditioner covers, locks, constant velocity joints, trim, hubcaps, radios, and wire harnesses.

C. Implications for U.S.-Mexican Trade Relations

The Mexican Government's current plans for the country's automotive industry and that industry's performance has several strong implications for U.S.-Mexican trade relations. While the Mexican Government's performance requirements and incentives in regard to the national automotive industry may be assisting in the growth of that industry, they also represent potential irritants to future U.S.-Mexican trade relations. Segments of the U.S. Government, the U.S. labor force and U.S. industry see definite disadvantages to the United States as a result of the charted course for the Mexican automotive industry. These actual or potential disadvantages are discussed below.

There is a growing concern in the United States, including government, that the Mexican Government's automotive policies represent artificial distortions of international trade and investment flows. The 1977 Automotive Decree stipulates the export of products from Mexico in order to do business in the country. Since the bulk of the new Mexican automotive exports will end up in the United States, it is probable that United States-based part production and export will be displaced and employment reduced, especially considering the current and projected low levels of

growth for the U.S. auto market in the 1980's (this is offset in part by continued exports of U.S. parts to Mexico). What is alarming about this prospect from a United States policy perspective is that the end result of reduced U.S. parts production will occur or will be perceived to occur not because of economic considerations or Mexico's comparative advantage, but because of a conscious governmental intervention to capture and distort international trade flows. There is reason to fear that the increased levels of U.S. firm investments in the Mexican automotive industry may not be in response to the dynamics of the international market place; and if not offset by adequate capital expansion in the United States, could adversely affect the structure of the U.S. automotive and parts industries.

The United States labor force is concerned that the successful implementation of the 1977 Decree will translate into increased unemployment for U.S. auto workers. This increased unemployment can manifest itself in two ways: 1) unemployment as a result of the closing of segments of the Mexican market that were previously supplied by U.S. auto parts firms and are now, by governmental decree, sourced by local firms or Mexican subsidiaries of U.S. firms; and 2) unemployment because markets in the United States that were formerly sourced by U.S.-based production facilities are now sourced by imports from the foreign subsidiaries of U.S. automakers.

The management of U.S. auto parts firms, particularly small- to medium-size firms, see the increased levels of automobile production and components sourcing in Mexico as a direct threat to the continued health of their business operations. The transfer of production operations to Mexico by the three major U.S. automakers represents the shrinking of U.S.-based auto parts manufacturers' market. Additionally, the Mexican Government's attempts to develop and strengthen the indigenous auto parts industry, and the assistance provided to this end by the U.S. automakers, may serve to create an internationally competitive Mexican auto parts industry which can eventually challenge the U.S. auto parts industry in its domestic market.

Ford, Chrysler and GM defend their increasing participation in the Mexican market by indicating that their investments in that country will result in the generation of U.S. automotive exports to Mexico and increased U.S. employment. Thus, Ford claims that of its \$365 million investment in a new Mexican 4-cylinder engine plant, roughly \$150 million will be

spent for equipment and tooling outside Mexico, primarily in the United States. Similarly, the President and General Manager of GM's subsidiary in Mexico, William G. Slocum, Jr., has stated the following about that company's plans to expand production capacity in Mexico:

Our volume was 57,000 vehicles sold at wholesale in Mexico last year [1979]. We're putting in place capacity to produce and sell 125,000 vehicles in a few years. That means material for 125,000 instead of 57,000 vehicles will be produced in the U.S. and shipped to Mexico, and that will provide for increased employment in the U.S. We're not exporting jobs to Mexico. We're looking at expanded potential of the car and truck business in North America, to keep the componentry we build in the U.S. going to Mexico, keeping jobs here and expanding our business and employment there.

The point to be made is that, despite the expansion of U.S. exports and employment, an increased presence by U.S. automakers in Mexico could, in an absolute sense, increase outflow of production by U.S. firms to foreign sites, probably representing a loss of exports, employment and business to U.S. supplier industries as a whole (but there is no conclusive evidence of this, as yet).

The basic issue relates to the broader question of adjustments in the international division of labor between industrialized nations such as the United States and newly industrializing nations such as Mexico. For the United States, it is not a simple matter of cheaper Mexican labor displacing higher wage U.S. labor. In large segments of automotive production (including engine production), the way for the U.S. industry to maintain its competitiveness in the world economy again (not only against Mexican competition but against Japan and segments of the Western European economy) is to automate and robotize production that will sustain our high wage level. In the long-run this is the only way the U.S. economy can sustain itself in a free trade system.

D. U.S.-Mexican and U.S.-Canadian Automotive Trade

The central difference between U.S.-Canadian and U.S.-Mexican trade in automotive products is that

while the former is structured around a U.S.-Canadian Automobile Agreement, the latter is not regulated by any specific trade agreements. The U.S.-Canadian agreement, enacted in 1965, was in essence designed to promote the trade between the two countries of finished vehicles and components on a duty-free basis, while dollar levels of imports and exports of automotive products are required to be kept in balance. As the Canadian automotive industry is dominated by the major U.S. automakers, a minimum level of Canadian value-added was established for vehicles produced in Canada. Through the mechanism of trading vehicles across a common border and permitting foreign ownership in the supplier industry in Canada, average costs of Canadian vehicles are within three percent of comparable U.S. vehicles. U.S.-Mexican automotive trade, on the other hand, is essentially unregulated. Mexico does enjoy GSP (General System of Preferences) status for several automotive items such as axle spindles, bumpers, radiators, mufflers and transmissions. Yet in the area of automotive trade, Mexico has acted unilaterally by means of the export requirements and import restrictions contained in the 1977 Automotive Decree. Mexican authorities, as a minimum, are seeking to balance trade in the automotive sector -- if not to generate an export surplus.

IV. NON-U.S. INVOLVEMENTS IN MEXICO

A. Description and Rationale of Involvements

Volkswagen of West Germany, Nissan (producer of Datsun) of Japan, and the French firm, Renault, are the major non-U.S. foreign presences in the Mexican automotive industry. VW leads the Mexican industry and has extremely strong production and marketing capabilities in the country. Nissan plays a relatively less significant role in the industry, with an 11 percent market share, but the Japanese firm appears committed to further developing its Mexican operations. Renault's involvement in the Mexican automotive industry is through a joint venture-type arrangement with the government-controlled Diesel Nacional automotive firm. Through its link-up with American Motor Corporation (AMC), Renault is also becoming involved with AMC's Mexican partner, Vehiculos Automotores Mexicanos (VAM). There are reports that the French automotive firm, Peugeot Citroen, is considering involvement in the Mexican market through an asso-

ciation with Automotriz O'Farrill, an established Mexican distributor.

A brief description of VW's, Nissan's and Renault's involvement and investment plans in Mexico follows:

- With great foresight, in 1966, when the entire Mexican domestic auto industry sold 81,139 cars, VW built its principal plant in Puebla with an annual capacity potential of 100,000 vehicles. In 1980 Volkswagen expects to produce 140,000 vehicles in Mexico, with 110,000-115,000 units going to the domestic market and the rest for export (primarily to Europe). VW will mount a \$600 million investment program for the 1980's. A new engine plant at its Puebla complex will open in early 1981, with a daily production rate of 1,600 engines. VW's leading position in the Mexican automotive industry can be attributed to the fact that its products have the highest quality and quality control, despite the fact that its percentage of imported parts is only 20 percent while the industry average is 35 percent. This leading position is further enhanced by VW's maintenance of the greatest number of sales outlets and best distribution system in Mexico.

- With an approximate annual production capacity of 45,000 cars and trucks, Nissan Mexicana operates its principal plant at Guernavaca and an iron foundry at Lerma. Nissan currently maintains an annual engine production capacity of 120,000 units but capacity will be enlarged to 210,000 units in the next two years. At present Nissan's Mexican operation exports 70,000 engines per year to Japan. Nissan recently embarked on a \$9 million expansion of its present \$59 million manufacturing and distribution investment in Mexico. Nissan has announced a total investment level of \$200 million by 1984.

- Renault has maintained a limited presence in Mexico, yet appears to be preparing to increase its involvement in this market. Its principal present involvement is primarily an equity and licensing arrangement with Diesel Nacional (DINA), which manufactures four Renault models. DINA-Renault's annual production capacity for cars and trucks is 40,000 units and the same for engines. Renault's U.S. partner, AMC, has a similar equity and licensing arrangement with VAM, the Mexican Government run auto firm, and through this arrangement Renault is becoming involved with VAM. They will jointly build a new engine plant and a new axle plant and VAM will produce a Renault car model.

Nissan and VW make extensive use of their Mexican operations in terms of a world car strategy. VW de Mexico furnishes components to other VW plants in Europe, the United States, and Latin America. Volkswagen's corporate strategy calls for interplant shipments of parts among manufacturing facilities in adjoining countries (i.e., Mexico to United States or Latin America) in order to facilitate specialization and economy of scale production at each plant. The West German firm's Mexican subsidiary exports body floor stampings and engines to VW's Westmoreland, Pennsylvania, plant. VW de Mexico also exports suspension system components to Volkswagen plants in Brazil. Eighty percent of the chassis, axles and front bushings of the Rabbit models assembled in the United States, Brazil and West Germany are produced in VW's Mexican facilities. VW de Mexico ships spare parts to company operations around the world. As already indicated, Nissan Mexicana exports 70,000 engines to Nissan Japan for final assembly. Additionally, Nissan plans to utilize its Mexican subsidiary to supply parts to its plants being built in the United States.

In general, VW and Nissan procure components for their Mexican operations from other company plants located throughout the world, from Mexican sources, or the components are produced in-house at the Mexican facilities. Yet, perhaps indicating the wave of the future, several Japanese auto parts manufacturers who have traditional supplier relationships with Nissan Japan are locating plants in Mexico at Nissan's request. These auto parts firms include Atsugi Motor Parts Company (oil and water pumps), Nikon Radiator Company and Kinugawa Rubber Industry Company.

B. Impact on the United States and Mexico

Nissan's, VW's and, to a lesser extent, Renault's involvements in the Mexican automotive industry have a general positive impact on the Mexican economy and industry and a mixed impact on the U.S. economy and automotive industry. The primary benefit to Mexico of these companies' involvements in the country lies in the strengthening effect they are having on the Mexican auto parts industry. About 2,000 local firms supply VW de Mexico with parts. The Japan External Trade Organization, in March 1980, sent a mission of experts in auto parts and components to Mexico to advise the local industry on how to increase its domestic manufacture ratio. This mission was to serve

as a preliminary step for Japan's auto parts makers to provide their Mexican counterparts with technological and financial help on a joint venture or other basis. Additionally, VW makes a significant contribution to Mexico's balance of payments. The Mexican subsidiary imports less parts than all other terminal manufacturers and is the only major Mexican exporter of finished cars. It recently announced plans to increase its shipment of Beetles to Europe from 27,000 units per year to 80,000. VW de Mexico also recently agreed to sell \$258.7 million worth of parts and accessories to VW of America. VW's exports amounted to one-third of Mexico's trade with West Germany and one-fourth with Brazil in 1979.

As VW de Mexico's commitment to sell \$258.7 million of parts and accessories to VW of America would seem to indicate, non-U.S. foreign involvements in the Mexican automotive industry will continue to pose problems for the U.S. balance of payments situation. Imports of these parts and accessories take work away from potential U.S.-based auto parts suppliers of VW of America and entail a net outflow of U.S. dollars to purchase them. Yet one positive benefit to the U.S. economy as a whole may result from Nissan's presence in Mexico. Because of the Mexican Automotive Decree of 1977, Nissan Mexicana must export automotive products in order to both import intermediate goods and increase sales in Mexico. Nissan does not have a manufacturing facility in the United States to which Nissan Mexicana can readily export components. This fact, combined with U.S. pressure resulting from U.S.-Japanese automotive trade relations, has resulted in the establishment of a Nissan plant in Smyrna, Tennessee.

TRANSPORTATION INDUSTRY

I. OVERVIEW

As Mexico's oil production and exports grow so do its imports of capital and consumer goods. Increasingly, however, transportation bottlenecks at ports of entry, seaports and internal transportation routes make delivery of these goods extremely difficult. Mexico's railways and highways are undergoing extensive renovation and upgrading. Railroads that are little changed from the ones that carried Pancho Villa's revolutionary army to Mexico City 60 years ago are clearly inadequate to carry Mexico's commerce into the twenty-first century. Mexico is trying to develop a modern railway system which will require purchase of significant amounts of modern railroad equipment, much of it from the United States. In the meantime, the movement of goods by rail will get worse before it gets better.

Mexico's highway system in many cases is little more than an extension of the nation's farm-to-market road system and is incapable of carrying the heavy multi-axle tractor-trailer rigs that characterize American truck transport. As with railroads, huge investments are being made to catch up, both in purchase of new over-the-road equipment and in new roads.

Mexico's civil aviation sector is booming, with the nation's two international air carriers on a virtual "buying spree" with American aircraft companies. Private or general aviation trade is expanding equally in response to the growing needs of Mexico's business and industrial leaders to be able to move quickly around their country on their own timetable.

Even in the areas where American companies are not able to sell new equipment in Mexico, there is a growing market for spare parts and equipment to maintain the existing elements of the transportation system.

II. RAILROADS

Railroad expansion falls into two categories: power and rolling stock; and fixed facilities such as yards, track, electric catenary and communications systems.

In October, the national railroad company announced a capital investment program for 1980-82 of \$1,559,000,000 to purchase locomotives, rolling stock, other equipment and facilities and to improve roadbeds, bridges and trestles to handle more and heavier trains.

In September, 1980, the national railroad, in association with General Electric, began the manufacture of 1,000 locomotives at a new plant in Aquascalientes. By the end of 1981, the first 33 locomotives will be produced at the plant. In the meantime, Mexico will purchase 78 diesel locomotives, all from the United States.

To provide rolling stock, the Mexican national railroad construction company plans to acquire 78,000 cars in the next 20 years, most of them to be constructed in Mexico. In 1980, the government invested 9 billion pesos in the railroads. During 1981, Mexico will purchase 1,500 boxcars, 1,000 flatcars and 120 tank cars, nearly all from the United States.

With assistance and technology from France, Mexico plans to electrify large portions of its railroad system, beginning in 1982 with a section from Mexico City to Queretaro. What Mexico calls its Basic Network -- 5,000 kilometers of track which handle 80 percent of the traffic -- is to be maximized with an extensive improvement system.

Five smaller railroads operate in Mexico but are slowly being merged into the NdeM system. These railroads are expanding and modernizing their facilities, but their contribution to the national capacity is relatively small and their authority to contract for long-range projects or future delivery of equipment is increasingly limited by on-going mergers.

A. Rolling Stock and Locomotives

During the past several years the national rail-

road (NdeM) has been hampered by inadequate locomotive power to move its rail cars. Several of the border crossing railways (Santa Fe, Missouri Pacific, Texas-Mexico, Southern Pacific) have leased or rented locomotives to the NdeM over the past two and a half years. Depending on their size (2,500 hp or 3,000 hp), the units have been rented for around \$500.00 per day. At year end there were about 120 U.S. locomotives in use by the NdeM in Mexico. Some of the units came into Mexico at the head of trains and were retained in Mexico, while others were specifically sought and shipped to Mexico. Both the American railways now leasing the equipment and the NdeM agree that this arrangement is temporary. However, it is a convenient short- to medium-term arrangement, both for the U.S. companies whose U.S. business is barely holding even -- and most of that due to grain shipments to Mexico -- and for the Mexicans whose business is expanding faster than they can purchase equipment.

The contract with General Electric calls for the delivery of about 100 units per year. An important feature of the contract is the construction of a plant in Aguascalientes for local manufacture of an increasing proportion of the equipment as the contract progresses. At an "average" industry price of about \$1 million per unit, the locomotive contract with GE could be worth as much as \$1 billion to GE over its life, although the precise terms are not available.

B. Electrification

At the same time, Mexico is electrifying its 5,000 mile "core" rail system. The GE contract calls for interchangeability between diesel-electric and all-electric locomotives. The electrification program also puts GE -- and other U.S. manufacturers -- in a good position to develop ancillary business relating to electric generation and transmission/distribution systems.

Although European manufacturers have far more experience in the realm of electric railways than do U.S. companies, there are strong technical reasons for U.S. companies to continue to be Mexico's chief external source of power. First, there are long-standing commercial relations between Mexican railroads and U.S. suppliers. Secondly, Mexico's railroads and equipment are built to Association of American Railroads standards, as are most western hemisphere railroads. European competitors in the Mexican rail market would

have to develop new product lines aimed specifically at the Mexican market. U.S. companies may literally take products "off the shelf" and sell them to Mexico with little or no change.

During the next two years NdeM expects to purchase nearly 7,000 railcars of various specifications. The majority of these will be supplied by Mexico's government-owned railcar construction company, Constructura Nacional de Carroferril. In recent years, a small number of cars (100-300 per year) have been purchased abroad, largely from the United States, and this practice will likely continue. Constructura anticipates filling Mexico's own railcar needs within the next four to five years with a consequent lessening dependence on sale or lease of cars from the United States.

Exports of locomotives, rolling stock and parts from the United States to Mexico during 1979 were healthy. Through the third quarter of 1980 there were strong indications that trade was continuing to increase. In 1979 the total value of locomotives, cars, and spare parts, including air brake equipment, actually moved into Mexico was \$100 million. Similarly, Commerce Department statistics through August, 1980 indicate a total value of railroad equipment moved into Mexico -- not including that ordered or delivered in the U.S. for future shipment -- to be about \$91 million. If the proportions remained the same, almost 25 percent more rail equipment was delivered to Mexico in 1980 as in 1979. The value of parts alone during the first three quarters of 1980 was about \$38 million compared with \$36 million for the entire year of 1979.

III. MOTOR VEHICLES

Mexican import regulations, combined with the status of her highway system, militate against the development of a heavy tractor-trailer motor carrier system similar to that of the United States. Import regulations encourage the construction of motor vehicles in domestic plants while the narrow and relatively light-duty roads and bridges that dominate the highway system encourage the use of large numbers of lighter trucks to move freight.

Lack of economy of scale makes many of Mexico's trucking companies relatively small and labor inten-

sive operations. They tend to re-equip with used equipment when they import at all. Thus during 1979 the total of all used trucks officially imported into Mexico -- 1,758 valued at \$5.1 million -- was nearly as great as the number of new trucks that came into the country -- 2,527 valued at about \$17 million. Of the imports, only a handful, fewer than 100, were heavy tractors capable of pulling 50,000 pound-plus loads in multi-axle trailers. Even when such equipment is used in Mexico, there is a tendency to seek European models because European manufacturers build equipment designed for narrow roads and small city streets. Trailers used in Mexico are smaller than those used in the United States.

Similarly, bus bodies are generally fabricated in Mexico to fit chassis that are also increasingly Mexican built. During 1979 the United States exported about 150 used buses to Mexico and only 13 new buses. The total value of both new and used vehicles was only slightly less than three quarters of a million dollars.

From the United States' viewpoint, the bright spot in the motor vehicle area is the realm of maintenance supplies and parts. During 1979 more than \$50 million worth of transmissions alone was exported to Mexico while the total value of auto, truck and bus parts exported was well above \$550 million.

During 1980 the export of vehicles remained static or was slightly lower for some types, but the parts market continued to expand with the value of auto transmissions for the first nine months of the year equal to the whole 1979 value, and the value of truck and bus transmissions exceeding the 1979 figure. The combined total for the first three quarters of 1980 was \$54 million.

(For a complete discussion of manufacture of trucks, see Automobile Industry Section, above.)

IV. AIRCRAFT

During the past two years Mexico's two international air carriers -- AeroMexico and Mexicana (Compania Mexicana de Aviacion) have purchased significant numbers of aircraft from both Boeing and McDonnell-Douglas. In addition, the private aviation sector has purchased hundreds of light planes from U.S. general

aviation manufacturers.

A. Commercial Aircraft

In mid-1978 Mexicana announced the purchase of five Boeing 727-200 aircraft for delivery in 1979 for a total price of more than \$85 million. A consortium of United States and Canadian banks financed the purchase. In mid-1979 Mexicana ordered an additional six 727-200 aircraft for a package price of \$102.3 million, 40 percent of which was financed by the United States Export-Import Bank.

Later in 1979 Mexicana added to its all-Boeing 727 fleet with the order of two DC-10-15 aircraft from McDonnell-Douglas. The aircraft was to be equipped with new high-thrust engines to allow full load take-offs from the high altitude Mexico City Airport. The planes were configured to carry 315 passengers in one class. The purchase was valued at \$85 million with delivery planned for 1981. At about the same time, AeroMexico, a long-time McDonnell-Douglas customer, also agreed to buy two DC-10-15 aircraft and seven variously configured DC-9 aircraft for a total value of about \$200 million.

The surge in passenger aircraft sales reflected both the increasing commerce between the United States and Mexico and Mexico's interest in becoming a hemispheric air carrier, showing its self-perception as an increasingly important regional power.

During 1980 Mexicana further expanded its fleet of medium-range wide-body aircraft, purchasing five more DC-10-15's with delivery expected during 1981 and 1982. The sales were valued at over \$200 million.

Mexico's increasing commerce virtually guarantees continuing sales of large passenger aircraft. While there are some competitors for medium-range, wide-body planes from the European consortium Airbus A-300 series, there are no competitors for long-range, trans-oceanic aircraft outside the United States. Potential buyers are virtually limited to the long-range version of the Lockheed L-1011, the McDonnell-Douglas DC-10 or the Boeing 747/747sp.

B. General Aviation

In the realm of general/business aviation, U.S.

companies enjoy a healthy and expanding relationship with Mexican buyers as well. Mexico's oil industry provides a market for helicopters, with U.S. builders selling 10 light (under 2,200 pounds) helicopters worth \$2.1 million and 18 heavy helicopters worth \$16.5 million during 1979. These numbers were more than matched during the first three quarters of 1980, with light helicopter sales totalling 20, worth \$4.6 million, and heavy helicopter sales totalling 15, worth \$14.2 million.

These aircraft are used extensively in the oil exploration and offshore crew and equipment supply aspects of the oil business. As long as Mexico maintains its policy of using domestic contractors where ever possible, including air services, the market for rotary wing aircraft should remain active.

In the fixed wing area, there is an increasing market for used aircraft in the higher quality and higher price ranges. Historically, many of the light planes that were sold in Mexico went into the agricultural sector for use as crop dusters and for short regional trips. Increasingly, the trade in used aircraft is reflecting the desire of business travelers to have their aircraft available. This pattern is reflected in the values of the used planes exported during 1979 and the first three quarters of 1980. The 1979 figures show the export of 115 used aircraft worth \$47 million. The September, 1980, figures show 58 used aircraft exported worth \$49 million.

There is a steady increase in the market for virtually all types of light planes up to and including semi-commercial business jets.

During 1979, U.S. companies delivered into Mexico a total of 228 light single- and multi-engine aircraft worth about \$20 million. During the first three quarters of 1980 the same companies delivered 416 similar aircraft worth about \$28 million. Heavier planes, those weighing over 10,000 pounds, showed even stronger market increases, with sales of 41 in 1979 (including two near 33,000 pounds), worth about \$42 million, and sales through September, 1980, of about 30 aircraft, worth about \$40 million.

In addition, aircraft parts were selling well in Mexico, with markets expanding in response to the increasing number of light planes operating in that country. A market that was historically valued at about \$20 million per year appears to be developing into one that is growing to more than \$100 million per

year.

While some of the increase may be attributed to Mexico's commercial airlines, substantial portions of the increase simply reflect the increasing size and higher quality of Mexico's general aviation fleet. Crop dusters and four seat single-engine aircraft of the past did not need sophisticated avionics or complex hydraulic gear that is standard on most business aircraft. In addition, Mexican charter companies are moving into the world of small jets. During 1980 the U.S. Export-Import Bank helped finance the \$17 million purchase of two Gulfstream aircraft by two Mexican charter companies. These comfortable and sophisticated planes are unlikely to be the last sold to companies catering to Mexico's business needs.

ELECTRONICS INDUSTRY

I. STRUCTURE

A. Overview

The Mexican electronics industry comprises a broad range of product categories and production technologies, ranging from large-scale production of some types of telecommunication equipment to job-shop manufacture of low-technology components for refrigerators. The industry as a whole has grown by approximately 10 percent per year for the past several years, and the Mexican Government's Industrial Development Plan calls for the electronics industry to expand at a rate of at least 14 percent annually up to 1984. Yet, in some sections, such as production of telephone and telegraph equipment, an average annual growth rate of as high as 18 percent is expected for the next few years. In many sections of the electronics industry, subsidiaries of foreign multinational corporations are dominant.

Given the diversity of the Mexican electronics industry, analysis will focus on three industrial sections: telecommunications, consumer electronics, and electronic components for various industries (in particular the automotive, telecommunications, and consumer electronics industries). Examination of these three sections should adequately cover the scope of the Mexican electronics industry.

B. Company Breakdown

The large number of firms which constitute the Mexican electronics industry are geographically dispersed throughout the country. Yet there are two areas of particular concentration -- around Mexico City and along the U.S.-Mexican border. This reflects, in great part, the presence of relatively large-scale foreign subsidiaries in these areas. The industry is fairly neatly divided between foreign-owned firms or joint ventures with larger plants and a greater number of employees and Mexican-owned firms with relatively small plants and few employees. There are, of course, some large Mexican public and privately owned firms.

For the telecommunications industry, there are approximately 150 foreign subsidiaries or Mexican firms in the telephone and telegraph section alone. Yet three foreign subsidiaries -- ITT's Indetel (Industria de Telecomunicacion S.A.), GTE, and the Swedish-owned Teleindustria Ericsson, S.A. -- dominate the telephone equipment section. Some estimates place these three firms' market share as high as 90 percent.

The West German-owned Siemens Telecomunicaciones S.A. is dominant in the telex market. Thus the telephone and telex industry is in the hands of companies with strong foreign ties, although both Indetel and Ericsson have participation by Telmex (Telefonos de Mexico -- a Mexican Government-run telecommunications firm).

In wire and cable production for transmission equipment, Mexico has strong capabilities, with this industrial section controlled by the Mexican Government's Condumex and the private Conductores Monterrey; yet no coaxial cable is manufactured in the country, and demand must be met entirely by import. In other sections, such as mobile radio, local production also predominates, but with a heavy dependency on imported components. Approximately 25 companies produce mobile radios, although roughly half are foreign-owned and account for 70 to 80 percent of production. In several sections of the telecommunications industry, such as video and radio broadcasting equipment, transmission equipment, and data communications equipment, local production is minimal and what does occur consists principally of unsophisticated equipment assembled subsequent to import by foreign subsidiaries. In general, in the telecommunications industry local assembly is more common than manufacture, and joint ventures are not common. Additionally, while demand for some telecommunications products is adequately met by local supply, in other product areas there is virtually no indigenous production.

In the Mexican consumer electronics industry there are over 150 participating firms (this does not include firms who only produce components for consumer electronics products). RCA, Zenith, GTE and Matsushita all produce color television chassis in plants along the U.S.-Mexican border. These plants' output is primarily destined for final assembly in the U.S., although some TVs are made for the Mexican market. Hitachi has a 30 percent equity share in Television del Distrito Federal, S.A., and provides this Mexican firm with technical assistance. The private Mexican conglomerate, with Alpha Group, bought Philco's, Admiral's and Magnavox's TV production facilities in

Mexico and is a major supplier of TV's to the Mexican market. Many of the companies mentioned above also manufacture a wide variety of other consumer electronics, including home appliances. A significant number of Mexican companies produce such items as radios, clocks, refrigerators, toasters, and washing machines. A fairly common form of participation in the consumer electronics industry by Mexican firms, which may only represent a portion of their overall activities, is through joint ventures with foreign firms. Thus, for example, IEM (Industrias Electricas Mexicanas, S.A.), a Mexican-controlled joint venture with Mitsubishi, derives 35 percent of its total sales from home appliances, TV's and audio equipment. Mitsubishi took Westinghouse Electric Company's place in IEM when the latter firm dropped its home appliance operations in 1974.

In the electronic components industry there are well over 200 firms. Twenty percent of these firms produce almost 80 percent of the total component output for the country. Several electronics-oriented multinational corporations maintain componentry production facilities in Mexico both for assembly in the country and out of the country. RCA, Fairchild, Motorola, Texas Instruments, Toshiba and Matsushita are examples of MNC's which manufacture componentry in Mexico. These foreign subsidiaries are complemented by a large number of Mexican firms which produce electronic components for various Mexican industries (in particular the automotive, telecommunications, and consumer electronics industries).

C. Manufacturing Activities

Several general observations about manufacturing activities in the Mexican electronics industry as a whole bear note before examining these activities in detail for the telecommunications, consumer electronics, and components industries:

- Foreign technology is relied on heavily and is primarily supplied by U.S., Japanese, Dutch and West German firms. This reliance on foreign technology is reinforced by the large number of MNC subsidiaries and joint ventures in Mexico. At the plant level, with few exceptions, foreign inventions, research and development are used. Emphasis has been placed on adaptation of imported technology to Mexican conditions and, especially, to small-volume markets,

although there is a lack of technical capabilities in this area (see below).

- While many Mexican electronics firms employ engineers, these men are, for the most part, production engineers who are primarily concerned with such manufacturing activities as plant layout and work handling. Few engineers in Mexican electronics firms are involved with product design or development. A relatively small number of firms has moved into the stage of product design adaptation, attempting to make (usually rather minor) changes in product components with a view toward increased sourcing of local inputs, machining with available plant equipment or reducing costs.

- As many of the Mexican electronics firms, particularly the larger ones, are subsidiaries or joint ventures of multinational corporations, the latter participate in the management of the Mexican firms and also supply their technological needs (design, engineering and manufacturing techniques). Because of these Mexican firms' easy access to engineering information and drawings from the parent companies, there has been little impulse in Mexico to take on further development work leading to new designs of local origin.

- Mexican electronics firms tend to have very little experience with large-scale production technology. This is coupled with the perception that large-scale automatic production machinery is too expensive for the needs of the local market. Despite rises in labor costs and labor problems over the last few years, automated equipment is therefore not considered cost effective.

- There are approximately 40 companies in the Mexican market that manufacture production machines and tools for the electronics industry, including furnaces, ovens, riveting tools, drilling tools and drill bits, presses, and welding equipment. These firms do not exclusively supply the Mexican electronics industry, but several other industries as well.

1. Telecommunications Industry

The Mexican telecommunications industry is dichotomized between products almost exclusively produced in Mexico and products almost exclusively imported. Many of the Mexican telecommunications products represent assembly operations with very high foreign content, especially for the higher technology compo-

nents. Local production of telecommunications components is characterized by a relatively low level of technology. The demand for higher technology in this industry will continue to be met, at least in the near future, through imports.

The Mexican telecommunications industry has not developed according to the country's comparative advantage. Domestic production tends to focus on 'smaller "off the shelf" items, while virtually all heavy equipment is imported. Many of the smaller items are produced at high costs, mainly because of grossly sub-optimal scales of production, while Mexico probably could be competitive in some of the heavy items which are more labor intensive and more specialized (for example, switchgear and transmission equipment).

Telecommunications products manufactured locally include central switchboards, private switchboards, telephones, long-distance equipment, multiple conference equipment, intercommunication systems, multiplex and cable. In general, these products are not very sophisticated in terms of technology.

2. Consumer Electronics

Mexico has a very extensive consumer electronics manufacturing industry. The production of consumer electronics goods and components is very well integrated in Mexico, and some products are internationally competitive. Components are almost 100 percent made in Mexico. Technical tie-ups between foreign electronics and Mexican electronics firms are not uncommon in this industry. The Alpha Group, for example, has a technical agreement with Hitachi which, in part, gives it a "technical window" into Hitachi's new electronics developments, such as the ferrite yoke for TV receivers. The Alpha Group also has an agreement with the Victor Company of Japan to assemble and distribute the latter's video tape recorder system. Production machinery as well as product technology in the Mexican consumer electronics industry tends to originate from foreign, particularly U.S., sources. Matsushita's Mexican color TV, audio products and components plant operates with equipment from the former Motorola plant in Franklin Park, Illinois that the Japanese firm bought in 1974. The Mexican plant received automated circuit board components insertion equipment and will take over the duties from the Illinois plant of circuit board inspection and TV tuner and chassis sub-assembly. Consumer electronics products manufactured in Mexico include black and white TV sets, color TV sets, stereo combinations, modular record players,

audio components, radios (including for automobiles), clock-radios, portable record players and tape recorders, cassette players and video tape recorders.

3. Electronic Components

The Mexican electronic components manufacturing industry is considered to be highly developed, especially in the production of low and medium technology components. Foreign technology is the rule. U.S. manufacturing subsidiaries and licensees are predominant, but Mexican components manufacturers using Japanese or West European technology are not uncommon. At least for passive components and related devices, production processes in Mexico are surprisingly highly automated, considering the low level of output found in most companies (this, in part, is caused by the protected nature of the industry). Components are distributed to a wide range of Mexican industries, but particularly to the consumer electronics, telecommunications, and automotive industries. To indicate the scope of components produced in Mexico, it should be noted that the following are manufactured locally: vacuum tubes, cathode-ray tubes, capacitors, potentiometers, coils, transformers, quartz crystals, printed circuits, connectors, mechanical switches for microwave equipment, and relays.

Brief descriptions of other electronics industry sectors are provided below in order to present a more balanced picture of the electronics industry as a whole in Mexico.

a. Measurement and Testing Equipment

This equipment is generally manufactured by Mexican majority-owned subsidiaries of foreign firms with a heavy reliance on imported components. The technology, as a rule, is 4 to 5 years old. In terms of wholly-owned Mexican companies, there is one major manufacturer of watt-hour meters, and three manufacturers of simple instrumentation (essentially assembling imported parts). Nevertheless, the bulk of Mexican demand for measurement and testing equipment is met through imports -- principally from the U.S., followed by Japan, West Germany and Holland.

b. Process Control Instruments

Domestic production is concentrated almost entirely in the hands of ten companies, which account for 90 percent of production and are all subsidiaries of U.S. firms. Sensors, transducers, accessories and

analytical instruments are all imported.

c. Semiconductors

There are only a few companies in the field and technology is generally 4 to 5 years old. Semiconductors produced in Mexico have high levels of imported components and materials. Outside of two joint ventures with Toshiba and Philips, most other Mexican semiconductor firms are tied to U.S. firms. Packaging and assembly operations are fairly common in Mexico, including the following steps: manual processing, thermo-compression bonding, ultrasonic bonding, chip soldering, hermetic sealing and encapsulation. Less common are thermo-sonic bonding and automated assembly; film carrier methods are not used, and there is no product design or wafer processing in Mexico.

d. Business Equipment

Only 22 percent of the Mexican computer market supply comes from local sources. This low percentage is due to the fact that, because computer technology changes so quickly, extensive production, with its attendant fixed capital costs, is not attractive to many Mexican electronics firms. There is a limited amount of minicomputer assembly from imported kits, although this represents a potentially large market. There is also limited production of computer terminals (with a required 60 percent national content) and parts for microcomputers and adding machines. Large numbers of calculators are made in Mexico with kits imported from the U.S. and cases and plastic parts manufactured locally (but this market is hampered by the ease of smuggling in this type of equipment).

e. Heavy Electrical Equipment

Power generation equipment is all imported except for some boilers and auxiliary equipment. There are 4 medium size and one large manufacturer of fairly large capacity power and distribution transformers, besides 15 small companies which make only distribution transformers. Two Mexican companies produce circuit breakers for low and medium voltage applications. The whole range of high and extra high voltage circuit breakers is imported. High voltage isolators and lightning arrestors are also mostly imported. Transmission line towers for all voltages up to 400 KV are fabricated in Mexico, partly by a private sector firm and partly by a subsidiary of the government's Federal Electricity Authority. Four large Mexican companies with foreign technical assistance and/or financial par-

ticipation produce conductors of copper and steel-wire aluminum. Porcelain and glass insulators for high voltage transmission lines as well as bushings for transformers above 69 KV are all imported. The lower range of bushings and insulators is produced locally. Medium voltage transformers for industry and small sizes of AC-DC converters are made in Mexico by 3 companies. Medium size motors (20 HP to 200 HP) are made by seven companies; three of them offer motors in the range of 200 to 1,250 HP and one of them up to 2,000 HP in the simpler types. Variable speed drives for rolling mills and other industrial applications, as well as DC motors and generators for diesel-electric and subway systems, at present, are not produced in Mexico. Recently, two companies have taken up the manufacture of medium size AC generators up to 500 KW for diesel-driven generating sets used for stand-by power supply and other purposes.

f. Photovoltaic Cells and Panels

At present, the Mexican electronics industry's involvement with photovoltaic products is minimal. Nevertheless, the Mexican Government has targeted photovoltaic products as being important enough to merit a government-directed R & D effort, with limited Mexican industry participation at this stage. [See also Section IV, below]

D. The Supplier Industries

As previously indicated, the Mexican electronic components industry is fairly sizeable, although this varies from sector to sector. Thus while approximately 80 percent of the components for the Mexican consumer electronics industry is supplied locally, large quantities of components and raw materials for production of telecommunications equipment are imported. In general, for any given sector of the Mexican electronics industry, the indigenous supply of a specific component is inversely proportional to the component's technological complexity.

There is a general move to self-sufficiency in certain of the larger components and consumer electronics manufacturing companies such as the subsidiaries of Philips, Motorola and GTE. This is not a move toward vertical integration but a recognition of the large number of gaps in local componentry production which must be filled by imports. The small size of the Mexican market inhibits a Philip's or GTE's

start-up of local production for certain components, but they have either gone into joint ventures with local firms or have bought out companies with capabilities in relevant component areas. Components such as wafers are imported from the U.S. and other countries; but acids, silicons, and laminates are some of the most commonly produced materials in Mexico.

For the telecommunications industry, there is very little sub-contracting to local ancillary industries. The end product makers, by and large, either manufacture needed components in-house, despite the obvious diseconomies of such operations, or import the components.

E. Marketing Activities

Industrial demand for electronics products has two salient characteristics. First, for specific products and components a small percentage of purchasers account for a large percentage of total sales. Thus there tends to be a concentration of purchasers. Second, for several sectors the Mexican Government is the predominant purchaser. This is particularly true for the telecommunications, heavy electrical equipment, and measurement and testing equipment sectors. Mexican Government investment programs for these sectors thus greatly influence the size and growth of the market. These government programs have been increasing in the past few years and are expected to do so for the next few years.

For the Mexican telecommunications industry, the market is dominated by telephone and telex equipment which accounts for over 75 percent of total sales for this sector. In 1979 total sales in the Mexican communications sector amounted to \$262 million. Of this figure, over half -- \$197,255,000, represented sales to government telephone companies, principally Telmex's 108 subsidiaries. Other Mexican telecommunications agencies are the next largest market, accounting for roughly 14 percent of total sales in 1979. Markets representing 3 percent or less of total sales for communications equipment in 1979 included broadcasting enterprises, police, public utilities, the petroleum industry, the fishing industry, and the banking and insurance industries.

The Mexican consumer electronics industry produced 2.76 million units in 1979, an increase of 24 percent over 1978. Most of these products were mar-

keted in Mexico. Given Mexico's new found oil wealth and government credit extension programs, the Mexican consumer electronics market is potentially huge.

Except for consumer electronics components shipped principally to the U.S. for final assembly, the vast majority of electronics components produced in Mexico are for domestic consumption. Of the \$260.5 million Mexican electronics components market in 1979, 94 percent or \$244.8 million was supplied by Mexican sources. This percentage is expected to almost reach 100 percent by 1981. Consumption of locally made electronics components is as follows: 75 percent to the consumer electronics industry; 15 percent to the telecommunications industry; 10 percent to all other industries. Within the electronic component sector a determined effort is being made by many companies to secure export markets, especially in Central and South America, to avoid financial losses in an industry suffering from overcapacity.

In the electronic component market the characteristic of a high concentration of purchasers for the bulk of production output of specific components is most apparent. Twenty percent of purchasers, for example, buy 75-80 percent of the annual output of capacitors and connectors. The five leading purchasers are General Electric, Philips, Telefunken, Admiral and Philco. Twenty-five percent of purchasers buy 75-80 percent of the annual output of filters, networks and crystals. Leading purchasers are Motorola, General Electric, Industrias Sintronic, S.A., and Ingenieria de Comunicaciones, S.A. Twenty percent of purchasers buy 75-80 percent of the annual output for printed circuits, with the major buyers being Toshiba, Philips, Admiral, and Teleindustrias Ericsson. Similar purchaser-output percentages hold true for resistors, relays, opto-electronic devices, discrete semiconductors, and wire and cable.

Two final points bear note concerning marketing activities in the Mexican electronics industry:

- For foreign firms, the establishment of a Mexican subsidiary has not been essential for success in the market. Many foreign firms successfully operate through representatives or agents.

- The potential market for electronic measurement and testing instruments is very large considering the extensiveness of the Mexican consumer electronics industry and the present relatively low standard of quality control methods.

F. Costs and Prices

A general rule appears to hold true throughout the various sectors of the Mexican electronics industry that Mexican electronics products, especially components, are several times more expensive than equivalent U.S., Japanese or West European products. Components such as capacitors, resistors, electronic coils, and transformers are often sold at 5 to 10 times their equivalent price in the U.S. According to Matsushita, it costs three times more to integrate Mexican-made components than to buy components from the home plant. A protected market, low-volume production rates, and low productivity are the main causes of high prices.

G. Imports and Exports

The Mexican electronics industry as a whole has an unfavorable trade balance. Large sectors of the national industry, such as the components and consumer electronics sectors, do relatively little importing or exporting and thus are more or less in balance. However, other sectors, such as heavy electrical equipment, telecommunications and production, measurement and testing equipment, have a high level of imports in many product categories which are not offset by exports from these sectors. For production, measurement and testing equipment and instrumentation, for example, over 90 percent of Mexico's demand is met through imports. The U.S. electronics industry alone exported over \$52 million of the products in 1979 (U.S. imports account for roughly 80 percent of Mexico's total in this area). Nevertheless, it should be noted in regard to Mexico's electronics exports that nearly half of the country's manufactured exports come from plants in the Border Zone which assemble products for the U.S. market, and about two-thirds of these assembly plant exports consist of electronics items such as electronics parts, television and communications equipment.

Much of Mexico's telecommunications equipment needs are met through imports, with the exception of telephone/telegraph equipment and a few other equipment categories. Roughly 50 percent of telephone/telegraph equipment is imported -- in general, the more sophisticated equipment. It is an axiom in this and other electronics sectors that the degree of importation of a product is in direct relationship to that

product's technological sophistication. There are only a few exceptions to this axiom. In the following categories all Mexican needs are met through imports: microwave equipment, coaxial cable, data communications systems, and communications test and measuring equipment. In such a product category as mobile radio, while national demand is met almost entirely by national production, there is a high percentage of imported parts in this item. Exports in the telecommunications industry are restricted almost exclusively to used TV and radio broadcasting equipment exported to Central America, and wires and cables (except coaxial cables). Wires and cables in the largest single telecommunications export category, amounting to \$15 million in sales in 1979 and expected to reach \$38 million by 1985.

In consumer electronics, an extensive and well protected national industry results in little overall import activity, although certain consumer electronics imports, particularly of more sophisticated items, have been dramatically increasing in the past few years. Total U.S. exports to Mexico of consumer electronics products amounted to slightly over \$59 million in 1979. This represented a 47.5 percent increase over 1978 exports. Phonographs and audio components were the largest U.S. export category, followed by color TVs and radio-phonograph combinations. Yet these imports have been more than offset by Mexican exports of consumer electronics products to the United States. Mexico is fourth behind Japan, Taiwan and Korea for exporting these products to the United States and in 1979 accounted for 5.8 percent of U.S. imports in this area. Just during the period from January to September, 1979, the dollar value of Mexican exports to the United States of audio and video electronics products was over \$179.5 million.

In the electronics component area only 6 percent of national demand is met through imports, with predictions of no component imports by 1981. Components which are imported tend to be of a high technology nature or in low demand. Exports of components are overwhelmingly from foreign multinationals' subsidiaries in Mexico to other plants outside Mexico for final assembly (in particular, to plants in the United States). Thus, for example, Texas Instruments' electronics sub-component plant in Mexico exports between 60 to 80 percent of its output back to the United States. Additionally, Mexico is the leading U.S. supplier of incomplete color TV sets. Exports rose 42.6 percent from 1.05 million units in 1978 to 1.49 million units in 1979. These exports are from the subsidiaries of such companies as Matsushita, Zenith

RCA, and GTE to final assembly plants of these companies in the U.S.

II. GOVERNMENT POLICIES

A. Overview of Government Plans

The Mexican Government's Industrial Development Plan calls for the national electronics industry to grow at a rate of at least 14 percent per year up to 1984. Yet there is no all-encompassing government plan whose purpose is to promote the development of the electronics industry. There is an assortment of programs and policies directed toward specific sectors of the electronics industry, such as the National Microwave Program; but relative to, for example, the automotive or petroleum industries, the electronics industry receives a lower government priority for development. Mexican government policies relevant to the enhancement of the domestic electronics industry are described below:

- The Mexican Government has indicated that specific critical sectors of the national electronics industry will be restricted, as much as possible, to Mexican participants. This includes the telecommunications, consumer electronics, electronics componentry and electrical power generation and distribution sectors.

- The government is a major purchaser of electronics equipment, and its procurement practices favor domestic industries. Two government agencies -- Telmex (Telefonos de Mexico) and Direccion General de Telecomunicaciones, for example, together account for nearly 80 percent of all communications equipment purchases and are also major purchasers of other telecommunications equipment such as mobile radio, broadcasting equipment, data communications, and communications test and measurement equipment. The Mexican Government is also the major purchaser of heavy electrical machinery.

- Import substitution policies are maintained, to the extent possible. These policies are most often carried out in the form of government procurement practices and national integration requirement programs, particularly for componentry. Passive compo-

nents, the largest segment of the national electronics componentry sector, have been specifically targeted for import substitution.

- Credit for purchases of consumer electronics items extended to lower income Mexican workers by the government agency FONACOT (Fondo de Fomento y Garantia para el Consumo de los Trabajadores) has proven to be very beneficial to the growth of the local consumer electronics industry. This credit is extended to workers who would otherwise find it almost impossible to finance purchases of various consumer electronics products. As a result, there has been a significant growth of the domestic consumer electronics market. In 1979, \$135 million worth of credit was extended, and this amount increased by 42 percent in 1980 to \$192 million.

- Trade regulation (protection) has been a major policy tool to strengthen the national electronics industry, but, in some cases, import restrictions which previously protected local industry are being progressively eased. For certain products prohibitive tariff and non-tariff barriers exist; for consumer electronics products, very little importation is allowed. Mexico currently has a 20 percent duty on television imports, for example, plus an additional surcharge of approximately 3 percent. Further, the import of consumer electronics products such as TV's requires an import license which is extremely difficult, and often impossible, to obtain. Smuggling of these items across the U.S.-Mexican border is widespread. The importation of all communications equipment also requires an authorized import permit which is denied for products that are adequately supplied by domestic sources. Tariff rates are 20 percent for computers and 50 percent for telephones.

B. Constraints

Several constraints on the development of the Mexican electronics industry bear note:

- The general lack of domestic supplies of high technology electronic components has restricted the development of national production capabilities in certain end products: telecommunications; heavy electrical equipment; production, testing and measurement equipment; computers; biomedical equipment and process control equipment.

- Outside of consumer electronics and appliances, the Mexican Government remains by far the major market for many electronics products. Thus, such electronics industry sectors as telecommunications and computers depend heavily on government procurement policies for market growth. It should also be pointed out that the Mexican market is not large enough to justify local production of several electronics products.

- In some cases, the failure of the Mexican Government to use procurement practices to support certain segments of the national electronics industry has prevented those segments from developing. For example, government agencies, which constitute roughly 90 percent of demand for power and electrical equipment, have often preferred imported equipment because it could be obtained under concessional or no import duty and could be financed with special credits at low interest rates offered by foreign manufacturers. Additionally, the lack of advance planning by these government agencies, in part because of their own uncertainty as to their budget allocations, also works to the advantage of the larger foreign firms who can supply equipment with less lead time than Mexican suppliers.

- Service problems impede, in general, the electronics industry's attempt to develop a strong domestic market. Mexican producers who are dependent on even one or two imported components, as most are, experience excessive delays in acquiring spare parts imports due to difficulty in obtaining import permits from the Mexican Commerce Secretariat.

- Electronics manufacturing firms are facing increasingly higher costs of labor which are not accompanied by comparable increases in worker productivity. Mexican labor efficiency has been estimated to be about 60 percent of that of U.S. workers in the electronics industry, while labor costs differentials between electronics workers in the two countries has narrowed to a rate of 1:1.8, if allowance is made for fringe benefits and productivity levels. The Mexican electronics industry also suffers from a critical deficiency of qualified technicians and engineers capable of performing design-engineering and servicing tasks adequately. Worker incentive schemes and training programs within the industry are lacking, and the resulting adverse impact on productivity is compounded by the general company practice of hiring workers in the lowest wage brackets.

- Currency fluctuations have seriously af-

fected the industry, and it is still susceptible to such fluctuations. The 1978 devaluation of the peso strongly reduced growth rates in several sectors of the Mexican electronics industry, most notably in consumer electronics. Other macroeconomic factors, such as inflation and general government policies of credit restriction to industry as a deflationary measure, have adversely impacted the development of the Mexican electronics industry.

C. Assessment of Government Plans

Mexican Government plans aimed at further developing the national electronics industry appear adequate, as far as they go. In fact, government involvement in this industry does not seem to be as extensive as in several other national industries. Nevertheless, whether it is because of, or in spite of, government plans, the Mexican electronics industry has grown at the healthy rate of over 10 percent in the past few years and is expected to grow even faster, at over 15 percent, in the next few years.

In some sectors of the Mexican electronics industry and for some policies the government's involvement has clearly been successful. From 1977 to 1979 the national telecommunications industry enjoyed a growth rate of over 15 percent per year in terms of sales, and from 1979 to 1985 this growth rate is expected to reach 22.5 percent. These rates are directly attributable to government actions such as the move to digital equipment for telephones, the government's educational programs, the National Microwave Program and plans for earth satellite stations. As a carrot, an attractive business climate created by the government has resulted in substantial involvement by foreign electronics firms in the national industry. As a stick, requirements for use of Mexican firms as components suppliers has greatly assisted the development of an extensive national electronics industry. Four multinational corporations -- Motorola, Philips, Telefunken and GE -- buy 60 percent of all components purchased in Mexico. These firms have indicated that they buy such large amounts of components from Mexican sources only because of the government's national integration stipulations.

In other cases, Mexican Government policies concerning the national electronics industry have not been so successful. The electrical equipment sector, for example, has not developed according to Mexico's

comparative advantage, largely due to the government's import licensing system. Heavy electrical equipment, such as switchgear and transmission equipment, in which Mexico could probably be competitive, as these products are relatively labor intensive and low-volume, are all imported by a government agency which is virtually free from any import restrictions. Smaller electrical equipment is produced in Mexico at very inefficient scales of production (and therefore high prices) mainly because end-users, who are by and large private sector firms, cannot obtain licenses to import this equipment. This sector presents a classic example of how poorly conceived incentives can distort a country's production structure, thus resulting in the domestic production of some items at high cost, while other items that could be produced more efficiently are being imported. The government import system is also counterproductive in terms of developing strong domestic markets in that excessive delays in acquiring needed imported spare parts (due to the difficulty in obtaining import permits) severely hampers servicing operations by electronics firms. Additionally, the Mexican electronics industry could be better served in the long run if the government established industry-wide technical standards, thereby enhancing product quality and international competitiveness.

III. FOREIGN INVOLVEMENT IN THE MEXICAN MARKET

As should be apparent from the preceding analysis, foreign firm involvement in the Mexican electronics industry is substantial, whether in the capacity of exporter or direct investor. U.S. electronics firms predominate in the Mexican market, followed by Japanese, West German and Dutch enterprises. For some electronics sectors and subsectors, foreign firms concentrate mainly on export activities. For other sectors and subsectors the establishment of a subsidiary, joint venture, or minority position manufacturing presence is the general rule (the decision to export or invest directly is conditioned by Mexican Government policies in regards to specific sectors and sub-sectors). For those foreign firms which directly invest in Mexico, the output of the manufacturing operation in the country is destined either for the domestic market, the Latin American market or, in the case of certain components, final assembly outside Mexico and the rest of Latin America.

Some general observations concerning foreign involvement in the Mexican electronics industry follow, including recently identified activities of foreign firms in the industry.

- There is an increasing trend among foreign electronics firms to use Mexico as a base of operations from which to penetrate the Latin American Free Trade Association (LAFTA) market. The export of electronic products from Mexico to LAFTA-member markets has the attraction of avoiding high LAFTA tariff rates while taking advantage of preferential rates. This holds particularly true for electronic production, testing and measurement equipment and computers. In regard to electronic componentry, several foreign, especially U.S., firms hope to eventually introduce the fully integrated production of components in Mexico so as to serve the whole Latin American market. In the foreseeable future, however, the percentage of the Latin American market which could be penetrated from Mexican-based operations is still too small to justify foreign investment.

- In general, for production, testing and measurement equipment and several categories of electronic componentry, European products are considered by Mexican public and private sector purchasers as being equivalent to U.S. products in terms of quality, while Japanese products are less preferred at the same price level. The U.S. electronics industry has a greater presence in Mexico with regard to distributors and number of representatives than European firms. The U.S. is also felt to have the advantage on parts availability and service due to the greater number of distributors.

- There are over 200 foreign electronics products assembly plants ("maquiladora") along the U.S.-Mexican border and in-bond plants located in Mexico's interior which primarily export output to the U.S.

- Texas Instruments de Mexico began investing \$73.6 million in 1980 for the construction of a Mexican electronics products plant. Union Carbide Mexicana is investing \$64.9 million for a Mexican plant to produce graphite electrodes.

- Matsushita's Mexican consumer electronics manufacturing facilities produce color TV receivers, electronic parts such as speakers, coils and electrolytic condensers, and audio products, including clock-radios, radio-cassette recorders and stereos. Matsushita located color TV receiver manufacturing

operations in Mexico in order to avoid U.S. dumping charges and import controls and also to provide a site from which to supply U.S. and Canadian assembly facilities with low-cost parts. Additionally, Matsushita is reportedly planning to set up a joint venture with a Mexican firm to manufacture 4 million manganese batteries a month.

- The Victor Company of Japan has recently signed a five year assembly-distributing arrangement with the Mexican conglomerate, Group Industrial Alfa S.A., for the latter to sell video tape recorders in the Mexican market.

- The French Government is aggressively promoting the penetration of the Mexican electronics market by its own national industry. In 1978, for example, a French electronics firm (C.I.T.) and the French Government sold Telmex (the Mexican Government's telephone company) a subscriber electronic switching system with one-third of the cost absorbed by the French Government and one-third by C.I.T. According to the contract, Telemex was to pay a one-third share of the cost after a year only if it was satisfied with the equipment; if Telmex was not satisfied, it could return the system to France at no charge.

- The French Government's Commissariat a l'Energie Solaire (COMES), as part of its general program to extend technical assistance to LDC's in areas of solar power and telecommunications, is drawing up an agreement with the Mexican Government to provide assistance for solar projects, which may involve photovoltaic cell technology, as COMES has capabilities in this area and has provided such assistance to LDC's in the past.

IV. PHOTOVOLTAIC SECTOR

At present, the photovoltaic cell and panel market in Mexico is very limited, and local industry involvement is minimal. Yet, the Mexican Government has targeted the photovoltaic sector as an important area for development of national markets and manufacturing capabilities. The government's National Solar Plan, for example, places relatively strong emphasis on the value to Mexico of a strong and growing photovoltaic sector. The Mexican Government represents the

largest single market for photovoltaic products by far. Government-funded construction projects, for example, increasingly have requirements for supplying photovoltaic equipment. Additionally, under the auspices of the Mexican Government, the University of Mexico and the University of Delaware are jointly engaged in photovoltaic research work.

The Mexican subsidiaries of foreign electronics firms are involved, to a minor degree, in the final assembly of photovoltaic products but, for the most part, they import finished photovoltaic products from parent plants for distribution in Mexico. West German and French firms have made the greatest inroads into the Mexican photovoltaic market to date. Photon Power of El Paso, Texas, has been the only U.S. company identified as being actively involved in the Mexican photovoltaic market, and that involvement is presently restricted to thoroughly examining the potential of the market. Japanese electronics firms have virtually no exposure in the Mexican photovoltaic market, but are becoming increasingly interested in it. Japanese consumer electronics firms, in particular, are exploring possibilities of manufacturing photovoltaic-powered products such as clocks, radios and audio equipment in Mexico for that market.

THE AGRO-INDUSTRIAL SECTOR

I. INTRODUCTION

Mexico has traditionally been an agricultural nation. From the time of the Aztecs, its population has subsisted on a diet centered around maize and beans. Contrary to popular American opinion, which pictures its southern neighbor as semi-arid in climate, Mexico has extensive rain-fed agricultural areas in the central, "core" states collectively known as the "Bajío." The Bajío includes the Federal District (Mexico City) and the states of Mexico, Hidalgo, Puebla, Morelos, Tlaxcala, Querétaro, Guanajuato, and parts of Jalisco, Aguascalientes and Michoacan. Until comparatively recently, Mexico was a net food exporter.

Mexico's food situation has changed radically in the last ten years. From being a net exporter of agricultural production, Mexico has recently become a net importer, particularly of grains from the United States. There are at least several reasons for this change. On the demand side, Mexico's population has continued to grow at high rates, estimated at 3.6 percent annually in the 1960's and early 1970's, and only recently dropping to below 3.0 percent. Such high population growth, together with slight increases in per capita income, have boosted food demand beyond the capacity of domestic food production.

On the supply side, Mexico has encountered significant obstacles in agricultural production. Despite the opening of new irrigated agricultural lands in the dry Northwest by large agribusinesses utilizing modern technology and management techniques, Mexican agriculture is increasingly constrained by natural limits in availability of prime farmland and by inefficient farming technology in the traditional, predominantly smallholder and rain-fed regions of the Bajío. To compound these problems, rains in Mexico have been below the historic average from the late 1960's to 1979. In addition, trends in world agricultural prices since the late 1960's, exacerbated by government pricing policy subsidizing the consumer, has made it relatively cheaper to import. Government price controls on agricultural products, for example, put many sugar producing and processing firms out of business, until the point where 70 percent of the enterprises in the sugar industry are owned and subsidized by the government.

However, Mexican agriculture continues to occupy a central place in the country's economy and, indeed, in its national self-image. While direct agricultural production contributed only eight percent of Mexican GDP in 1980, it directly employs a large percentage of the population and supplies raw materials to Mexico's burgeoning agro-industrial establishment.

The present administration of Lopez Portillo has resolved to simultaneously address several inter-related problems: boost agricultural production; strengthen the agro-industrial sector, particularly at the small-scale enterprise level; and raise nutrition levels among the poor, particularly in rural areas.

Of course, food policy has always been a highly political topic in Mexican society, and the present is no exception. The recent program and policy innovations in the agricultural and agro-industrial sector have brought to the fore once again such questions as the distribution of benefits between Mexico's large, modern farmers and its traditional smallholder sector, between food producers and consumers, between large agro-industrial businesses and small-scale enterprises, and between Mexican firms and foreign, notably U.S., investors. In a country with a revolutionary mystique, programs and policies which suggest strengthening capitalist and/or foreign interests are, to put it mildly, highly suspect.

However, inasmuch as the last thing Mexican policymakers want is to wind up a petroleum-rich, food-poor country, it is likely that the major thrust of the current administration's proposals for the rural sector will be implemented. In particular, as part of the effort to strengthen the rural food production, processing, and distribution system, the government seems likely to promote both large-scale and small-scale agro-industry.

II. AGRO-INDUSTRIAL PROFILE

A. Subsector Characteristics

Agro-industry 1/ accounts for about 42 percent of

1/ Defined by the Government of Mexico (GOM) to include all the manufacturing activities specified in

value-added in manufacturing in Mexico, the largest share of any manufacturing subsector. Food beverages, and tobacco alone contribute about 23 percent of value-added, while textiles, garment making, wood and cork products, furniture, paper and leather goods account for an additional 19 percent (see Table I). Table II indicates the degree of change in value-added in the manufacturing sector of Mexico during the 1965-1975 period. Agro-industry as a whole increased its value-added by a compound annual rate of 6.4 percent during this ten-year period. Food beverages and tobacco alone had a growth rate of 7.7 percent, while the entire sector grew at a rate of 7.6 percent. In contrast, domestic food production dropped its rate of growth over the same time period, falling behind the pace of population growth in later years.

Agro-industrial firms in Mexico tend to be more numerous, smaller, and less productive than other industrial enterprises. Agro-industrial enterprises, according to the last Industrial Census (1970), totalled 70 percent of all manufacturing firms, yet employed only 50 percent of all workers in the industrial sector and contributed only 42.5 percent of the value of gross output for all manufacturing.

In fact, most agro-industrial firms are small and as a whole contribute a very small share to total agro-industrial production. Of 83,360 agro-industrial firms, 78,957 (94.7 percent) are small, 3,856 (4.6 percent) are medium, and 547 (0.7 percent) are large.
2/ Yet small firms account for only 14 percent of gross agro-industrial output, medium-sized firms for 42.5 percent, and large enterprises for 43.5 percent.

More detailed, but less complete, data on Mexican agro-industrial firms are provided in Table III for 1976. Output and value of specific agro-industrial products for 1976 is presented in Table IV.

Annex A, including food, beverages, tobacco, textiles, wood and cork, shoes and leather, furniture, paper, certain chemicals, and some equipment. For the purposes of this study, we have concentrated on food, beverage and tobacco industries.

2/ All enterprises with 25 employees or less are defined as "small," those with 26 to 250 employees are "medium," and those with more than 250 employees are "large." Most enterprises defined as "small" are in food processing or garment making.

Table 1: Principal characteristics of manufacturing enterprises in Mexico according to size and type of activity (1970) 17, 27, 37

	Number of Establishments			Establishment	Small	Medium	Large	Total	Wages and Salaries	Wage	and Salaries	Size	Total	Total Capital Invested (Thousands \$M)	Small	Medium	Large	Total		
	Small	Medium	Large																	
Total Manufacturing Industry	110,419	7,321	1,431	10,963	264,168	364,635	420,464	1,361,267	2,045,736	11,121,001	11,160,141	22,343,026	11,000,916	57,201,432	67,261,536	126,415,961				
Food	53,349	1,039	169	54,332	104,079	12,453	91,131	200,473	933,667	1,221,864	1,066,415	1,114,366	1,270,976	10,731,932	13,902,531	22,479,457				
Beverages	11,193	276	76	10,093	6,218	22,323	26,299	62,631	61,144	631,112	1,119,464	1,031,777	1,031,777	1,031,777	1,031,777	1,031,777	1,031,777	1,031,777		
Chemical	2,321	16	13	6,031	2,044	1,777	1,777	10,663	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104			
Leather	2,469	978	163	3,792	13,467	21,154	62,943	156,033	1,281,205	1,281,205	1,281,205	1,281,205	1,281,205	1,281,205	1,281,205	1,281,205	1,281,205			
General Industry	12,769	904	23	13,708	60,573	59,574	58,172	124,579	377,424	652,326	111,022	111,022	111,022	111,022	111,022	111,022	111,022	111,022		
Metal & Metal Products	3,392	194	53	3,369	9,493	13,464	10,834	17,123	27,273	288,024	308,071	308,071	308,071	308,071	308,071	308,071	308,071	308,071		
Non-Metallic Minerals	3,360	167	12	3,019	12,259	16,259	14,449	21,259	32,359	32,359	32,359	32,359	32,359	32,359	32,359	32,359	32,359			
Plastic Goods	796	166	23	617	3,397	16,259	17,464	27,563	49,179	49,179	49,179	49,179	49,179	49,179	49,179	49,179	49,179			
Printing	4,738	264	26	4,632	19,353	23,659	13,676	36,872	280,446	610,797	420,614	1,267,057	1,267,057	1,267,057	1,267,057	1,267,057	1,267,057	1,267,057	1,267,057	
Leather Goods	1,213	162	3	1,218	4,943	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116		
Rubber Goods	3,236	106	10	3,040	8,206	7,113	6,488	22,209	83,941	186,023	299,066	1,718,266	2,227,865	4,235,157	1,718,266	1,718,266	1,718,266	1,718,266		
Chemicals	2,093	601	122	2,028	15,251	61,124	61,124	1,964	4,699	5,733	61,066	55,326	126,132	20,969	532,276	1,480,784	1,480,784	1,480,784		
Petro-Chemicals	2,123	64	6	2,056	2,231	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964	1,964		
Non-Metallic Minerals	1,723	165	62	1,626	2,226	1,531	1,684	53,793	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074			
Steel and Iron	1,964	663	67	8,906	27,156	46,229	45,229	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461			
Mechanical	1,964	602	41	2,112	9,230	20,202	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461			
Electrical Machinery	369	376	96	1,062	4,067	31,034	30,091	30,091	30,091	30,091	30,091	30,091	30,091	30,091	30,091	30,091	30,091			
Transport Equipment	2,362	196	57	2,271	16,369	11,121	6,666	49,179	106,367	260,200	193,073	561,663	561,663	561,663	561,663	561,663	561,663	561,663		
Various Manufactures	2,362	196	23	2,271	16,369	11,121	6,666	49,179	106,367	260,200	193,073	561,663	561,663	561,663	561,663	561,663	561,663	561,663		
	Value Added (Thousands \$M)				Person Production (Thousands \$M)				Cost of Capital Invested Plus Labor Costs				Capital (Thousands \$M)				Total Capital Invested (Thousands \$M)			
	Small	Medium	Large	Total	Small	Medium	Large	Total	Small	Medium	Large	Total	Small	Medium	Large	Total	Small	Medium	Large	Total
Total Manufacturing Industry	6,219,026	29,451,377	44,700,038	82,392,641	20,537,673	76,311,762	117,435,133	212,406,449	4,634,573	16,942,344	26,397,697	47,964,626	2,401,074	2,401,074	2,401,074	2,401,074	2,401,074	2,401,074	2,401,074	
Food	2,281,728	4,920,223	4,321,226	11,226,171	7,203,153	17,764,311	12,799,781	39,721,439	1,721,156	2,261,017	3,242,072	6,213,201	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	
Beverages	1,213,794	1,329,361	1,329,361	4,005,933	5,121,795	7,181,200	7,181,200	10,913	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010		
Chemical	8,350	46,303	1,791,316	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398	1,644,398		
Leather	1,661,110	1,658,166	966,601	3,461,065	1,800,765	6,467,000	6,467,000	11,200,765	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010	1,060,010		
General Industry	12,769	12,769	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227	1,523,227		
Metal & Metal Products	3,360	3,360	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917	1,217,917		
Printing	4,738	4,738	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226	2,226		
Leather Goods	1,213	121	22	1,218	4,943	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116	6,116		
Rubber Goods	3,236	106	10	3,040	8,206	7,113	6,488	22,209	83,941	186,023	299,066	1,718,266	2,227,865	4,235,157	1,718,266	1,718,266	1,718,266	1,718,266		
Chemicals	2,093	601	122	2,028	15,251	61,124	61,124	1,964	4,699	5,733	61,066	55,326	126,132	20,969	532,276	1,480,784	1,480,784	1,480,784		
Petro-Chemicals	2,123	64	6	2,056	2,231	1,531	1,684	53,793	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074		
Non-Metallic Minerals	1,723	165	62	1,626	2,226	1,531	1,684	53,793	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074	10,074		
Steel and Iron	1,964	663	67	8,906	27,156	46,229	45,229	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461		
Mechanical	1,964	602	41	2,112	9,230	20,202	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461	15,461		
Electrical Machinery	369	376	96	1,062	2,055	5,133,561	5,313,564	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664	1,642,664		
Transport Equipment	11,521	1,021,693	1,021,693	3,149,961	3,009,048	4,646,446	4,646,446	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693		
Various Manufactures	11,521	1,021,693	1,021,693	3,149,961	3,009,048	4,646,446	4,646,446	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693	1,021,693		

¹⁷ Based on National Economic Commission's composite of 1970 industrial census. The listing of activities is not exhaustive of all manufacturing sectors.

¹⁸ All enterprises with 25 employees or less are defined as "small", those with 26 to 200 employees as "medium".

³⁷/ The nine underlined categories comprise the micro-industrial subsector.

Source: Mexico-Manufacturing Sector: Situation, Prospects, and Policies, World Bank, 1974.

Table 2: Value added in manufacturing (million 1975 dollars)

Sector (ISIC)	1965		1970		1975		Annual Growth 1965 - 75
	Value Added	Percentage distribution	Value Added	Percentage distribution	Value Added	Percentage distribution	
20 - 22 Food, beverage, and tobacco	1,380	22.7%	2,213	22.7%	2,906	22.7%	7.7%
23 Textiles	574	9.4	773	7.9	818	6.4	3.6
24 Clothing, footwear, and made-up textiles	319	5.2	424	4.3	396	3.1	2.2
25 - 26 Wood products and furniture	140	2.3	245	2.5	317	2.5	8.5
27 Paper and paper products	211	3.4	325	3.3	459	3.6	8.1
28 - 29 Printing and publishing Leather and leather products, except wearing apparel	216	3.5	325	3.3	345	2.7	4.8
30 Rubber products	120	0.5	54	0.6	60	0.5	6.8
31 - 32 Chemicals and chemical products	881	1.9	221	2.3	261	2.0	8.1
33 Non-metallic mineral products	14.4	1.442	14.8	2,057	16.0	8.8	
34 Basic metal	522	8.5	865	8.9	1,259	9.8	9.2
35 - 38 Metal products	1,303	21.3	2,219	22.7	3,065	23.9	8.9
39 Miscellaneous	9	1.5	137	1.4	203	1.6	9.4
20 - 39 Total	<u>6,178</u>	<u>100.0%</u>	<u>9,158</u>	<u>100.0%</u>	<u>12,821</u>	<u>100.0%</u>	<u>7.6%</u>

Source: Industrial Censuses.

Table 3: Principal characteristics of agro-industrial activity

	No. of Establishments	No. of Employees	Wages, Salaries & Benefits (mil. pesos)	Person Hours Worked (mil.)	Value of Production (mil. pesos)
Total	1,263	466,270	38,739,738	64,711	237,638,914
Meat processing (packing, canning, etc.)	60	5,312	268,052	808	3,098,193
Milk processing (condensed, evaporated & powdered)	10	2,956	277,487	395	3,060,556
Fruit & vegetable processing	31	9,623	455,400	1,120	2,430,736
Fish and seafood processing	29	7,825	313,649	912	1,190,278
Wheat milling	103	5,476	305,060	751	5,918,244
Corn milling (cornmeal)	7	1,217	75,806	186	1,037,348
Coffee grinding & tea processing	3	567	57,944	95	1,167,682
Production of crackers & food mixes	23	10,490	645,032	1,201	2,440,862
Production of gums	3	2,031	165,778	251	818,575
Production of starches, yeasts, etc.	8	1,487	146,784	158	1,210,831
Production of oils, margarines, & vegetable shortening					
Animal feed manufacture	62	9,238	572,035	1,305	10,076,059
Malt manufacture	48	4,590	311,374	597	6,749,527
Beer manufacture	6	848	81,717	123	1,144,691
Manufacturing/bottling of soft drinks & potable and sparkling waters	18	17,364	1,499,580	2,141	12,560,765
Cigar & cigarette manufacture	73	34,575	2,114,514	4,273	7,609,150
Thread, fabric & finished (cotton) clothing manufacture	11	4,833	43,029	607	6,526,766
Cashmere, flannel & feather clothing manufacture	45	23,171	1,603,351	3,719	5,296,336
Paper & paper (wood) products manufacture	14	5,504	371,584	840	1,183,068
Cardboard, carton & laminated paper products manufacture	43	18,102	1,699,715	2,829	9,383,757
Cardboard container & packaging manufacture	27	2,196	179,750	350	1,045,733
Tire & innertube manufacture	26	5,886	513,334	843	3,214,224
Manure and fertilizer production & manufacture	8	9,292	1,557,188	1,043	5,813,528
Machinery & farming implements manufacture & assembly	18	7,091	720,155	974	4,253,936
	5	2,672	237,848	355	1,388,353

Table 4: Production by type of activity and principal items,
January-December 1976

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
PREPARATION, PRESERVATION, PACKING AND CANNING OF MEATS			3,098,193
Ham	t.*	13,657	572,418
Bacon	t.	3,132	93,611
Sausage	t.	23,774	487,999
Other refrigerated meats	t.	4,350	121,103
Canned meat	t.	2,454	63,249
Deboned beef	t.	16,417	399,883
Deboned horsemeat, mule & donkey meat	t.	8,581	132,989
Beef, slit carcass	t.	20,504	372,809
Pork, slit carcass	t.	22,981	423,054
Animal fat	t.	12,347	161,316
Hides and skins	t.	5,581	62,232
Poultry	t.	803	21,089
Other			186,441
MANUFACTURE OF POWDERED, EVAPORATED AND CONDENSED MILK			3,060,556
Milk:			
Powdered	t.	21,739	927,097
Non-fat powdered	t.	50	1,522
Condensed	t.	22,977	309,300
Evaporated	t.	105,874	978,061
Dietetic	t.	14,109	663,546
Fortified food products	t.	5,298	150,130
Other			30,900
PREPARATION, PRESERVATION, PACKING AND CANNING OF FRUIT AND VEGETABLES			2,430,736
Containerized products:			
Strawberries	t.	2,727	36,482
Pineapples	t.	16,137	126,866
Tomatoes	t.	45,408	336,186
Other fruits (preserves & juice)	t.	61,642	547,300
Peppers	t.	82,956	676,094
Peas	t.	8,069	85,201
Olives	t.	550	14,474
Frozen strawberries	t.	6,323	55,340
Other containerized products	t.	15,186	277,290
Other			275,503

Source: Revista de estadística, 1977

* t - metric ton

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
PRESERVATION, PACKING AND CANNING OF FISH AND SEAFOOD			1,190,278
Canned products:			
Abalone	t.	1,275	95,190
Sardines and mackerel	t.	26,599	364,806
Shrimp	t.	2	119
Tuna	t.	4,313	164,529
Fish meal	t.	8,305	44,701
Frozen shrimp	t.	2,882	331,257
Frozen fish	t.	2,027	26,090
Other			163,586
WHEAT MILLING			5,918,244
First class flour	t.	1,501,209	4,689,321
Second class flour	t.	69,284	204,033
Unthreshed, whole, etc.	t.	89,318	161,665
Bran	t.	373,550	609,592
Grain, small grain, etc.	t.	88,801	160,440
Other			93,193
CORN MILLING			1,037,348
Corn flour	t.	358,407	1,032,798
Other			4,550
COFFEE PRODUCTION			1,167,682
Ground coffee	t.	9,550	1,077,300
Other			90,382
PRODUCTION OF CRACKERS AND FOOD BATTERS			2,440,862
Crackers:			
Thin	t.	69,643	739,223
Plain	t.	79,110	581,420
Soda	t.	31,551	347,801
Batters	t.	89,187	559,390
Premixed flours	t.	26,501	206,946
Other			6,082

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
PRODUCTION OF GUMS			818,575
Gum	t.	26,949	744,242
Other			74,333
PRODUCTION OF STARCH, FECULA, YEAST AND SIMILAR PRODUCTS			1,209,147
Starch	t.	28,338	105,038
Corn fecula	t.	81,347	335,611
Yeast and baking powder	t.	18,899	191,756
Glucose	t.	48,552	196,871
Corn oil	t.	3,773	67,161
Corn bran	t.	11,401	21,010
Amisol	t.	3,742	13,546
Corn germ	t.	15,282	62,628
Other corn products	t.	48,749	188,392
Other			27,134
PRODUCTION OF OIL, MARGARINE AND VEGETABLE SHORTENING			10,076,069
Oil from:			
Cottonseed	t.	62,384	761,776
Sesame	t.	26,978	390,691
Edible blends	t.	86,193	1,150,783
Coconut	t.	7,414	87,614
Saffron	t.	123,768	1,799,917
Soybean	t.	72,215	824,432
Vegetable fat	t.	171,473	2,187,325
Margarine	t.	12,953	226,553
Pastas	t.	765,690	2,037,819
Cotton oil	t.	25,750	64,236
Other	t.		544,923
PRODUCTION OF ANIMAL FEED			6,749,527
Concentrated feed for:			
Wild birds	t.	1,379,857	3,985,926
Pigs	t.	621,033	1,769,675
Cattle	t.	334,807	698,708
Other			295,218

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
PRODUCTION OF MALT			1,144,691
Malt, all types	t.	215,880	1,029,041
Other			115,650
PRODUCTION OF BEER			12,560,765
Bottle	'000 liters	1,584,317	9,501,062
Keg	"	39,120	206,671
Can	"	314,295	2,795,674
Other			703
MANUFACTURE OF SOFT DRINKS, AND BOTTLED AND SPARKLING WATER			7,609,050
Flavored drinks	'000 liters	927,215	2,026,122
Cola drinks	"	1,895,363	4,312,428
Sparkling and mineral water	"	141,753	241,257
Other soft drinks & carbonated water	"	128,773	308,346
PRODUCTION OF CIGARETTES			6,526,766
Cigarettes	'000 packets	2,242,750	6,526,693
Other			73
COTTON YARN, CLOTH AND FINISHED CLOTHING			5,296,336
Unfinished fabrics	t.	12,390	630,868
Cotton shirting and twine	t.	4,091	274,454
Cotton sacks	t.	2,544	86,001
Gabardine	t.	7,726	446,479
Denim, tweed, khaki	t.	21,297	1,386,021
Poplin and colored woven fabrics	t.	8,660	766,886
Percale and batiste	t.	3,148	247,560
Other fabrics	t.	11,905	815,339
Other			642,728
PRODUCTION OF CASHMERE, FLANNEL, FEATHER BEDDING & SIMILAR PRODUCTS			1,183,068
Yarns:			
For own use	t.	3,898	
For sale	t.	1,702	104,214

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
PRODUCTION OF CASHMERE, FLANNEL, FEATHER BEDDING & SIMILAR PRODUCTS (cont.)			
Cashmere	t.	1,780	526,752
Coat fabrics	t.	916	100,117
Cotton blankets and quilts	t.	1,078	67,411
Worsteds	t.	625	40,384
Flannel, all types	t.	662	92,352
Other			251,798
PRODUCTION OF WORSTEDS			776,074
Yarn, all types:			
Own use	t.	530	
For sale	t.	3,283	267,678
Worsted	t.	4,377	422,905
Flannel	t.	146	17,770
Cotton blankets and quilts	t.	43	6,352
Other			61,369
MANUFACTURE OF WOOD PULP AND PAPER			9,383,757
Wood pulp:			
Sulphate:			
Own use	t.	174,665	
For sale	t.	137,070	651,930
Sulphite:			
Own use	t.	10,771	
Mechanical:			
Own use	t.	56,986	
For sale	t.	4,098	13,399
Pressed pulp:			
Own use	t.	83,063	
For sale	t.	75,497	336,967
Straw:			
Own use	t.	30	
For sale	t.	6,679	26,952
Other pulps:			
Own use	t.	1,833	
For sale	t.	17,467	101,170

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
MANUFACTURE OF WOOD PULP AND PAPER (cont.)			
Paper:			
Kraft 100%	t.	201,702	1,302,254
Semikraft	t.	240,235	970,276
For writing and printing	t.	259,638	3,099,735
Hygienic and facial	t.	122,589	1,834,949
Carton	t.	44,247	276,404
Newsprint	t.	52,133	294,513
For cigarettes	t.	2,691	66,067
Other papers	t.	35,615	364,734
Other			44,407
MANUFACTURE OF CARDBOARD, CARDBOARD AND CARTON SHEETS, INCLUDING PETROLEUM-SATURATED SHEETS			
Carton for wrapping and packing	t.	34,759	159,090
Gray cardboard	t.	14,215	63,915
Corrugated cardboard	t.	26,778	122,002
Thin cardboard	t.	6,423	69,333
Padded cardboard	t.	92,381	525,153
Fluted cardboard sheets	'000 pieces	12,333	77,194
Others			29,046
MANUFACTURE OF CARDBOARD CONTAINERS AND BOXES			
Cardboard boxes	t.	363,297	2,754,950
Cardboard containers and cases	t.	10,086	144,103
Other cardboard products	t.	16,762	178,303
Other			136,868
MANUFACTURE OF TIRES AND INNER TUBES			
Tires for:			
Automobiles	'000 pieces	3,933	1,662,781
Trucks	"	2,217	2,784,063
Bicycles	"	3,148	115,012
Motorcycles	"	229	28,517
Agricultural machinery	"	103	174,788
Inner tubes, all types	"	5,884	375,828
Material for vulcanization	t.	10,490	218,903
Other			453,636

Table 4: Production by type of activity and principal items,
January-December 1976 (continued)

Type of activity and principal items	Unit	Quantity	Value ('000 pesos)
MANUFACTURE OF MANURES AND FERTILIZERS			4,253,936
Nitrogenized fertilizers:			
Anhydrous ammonia:			
For own use	t.	22,721	
For sale	t.	871,150	408,934
Ammonium sulphate:			
For own use	t.	20,537	
For sale	t.	616,056	428,891
Ammonium nitrate	t.	152,094	194,603
Urea	t.	350,701	606,807
Phosphated fertilizers:			
Single superphosphate:			
For own use	t.	19,098	
For sale	t.	269,485	147,382
Triple superphosphate	t.	214,516	396,132
Multiple fertilizers:			
Formulas and compounds	t.	370,405	660,117
Sulphuric acid:			
For own use	t.	1,299,779	
For sale	t.	115,517	47,929
Phosphoric acid:			
For own use	t.	125,614	
For sale	t.	197,706	881,427
Other			491,714
MANUFACTURE AND ASSEMBLY OF AGRICULTURAL MACHINERY AND IMPLEMENTS			1,474,517
Tractors with wheels	Unit	11,142	1,071,565
Ploughs	"	5,980	114,937
Reapers	"	5,593	120,365
Other			167,650

Table 5: Production by commodity and indices of total agricultural and food production, average 1961-65, annual 1970-75

COMMODITY	-1,000 METRIC TONS-											
	AVERAGE 1961-65	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	
WHEAT	1,078	2,010	2,010	1,073	2,000	2,000	2,000	3,020	2,010	2,030	2,020	
RICE, PADDY	316	403	367	420	403	770	459	525	412	400	400	
CORN	1,039	8,079	9,032	8,010	9,000	7,700	9,000	9,000	9,700	9,000	9,000	
BARLEY	115	238	237	237	236	236	236	236	236	236	236	
OATS	63	63	22	29	64	64	64	64	64	64	64	
SORGHUM	492	2,747	2,573	2,001	2,000	2,750	2,000	3,020	2,000	2,000	2,000	
BEANS, DRY	709	1,000	1,000	877	1,000	930	1,000	1,000	970	700	700	
CHICKPEAS	113	157	163	90	100	199	76	88	103	150	150	
POTATOES	378	513	538	566	559	650	600	637	600	600	600	
ONIONS	295	153	206	206	206	206	206	206	206	206	206	
SUGARBEET	19,033	20,520	23,000	23,000	20,000	30,000	30,000	20,000	20,000	20,000	20,000	
TOBACCO	90	63	58	56	61	52	57	61	61	61	61	
COTTON	503	313	373	390	372	510	196	224	372	353	353	
COTTONSEED	602	630	692	733	659	875	366	366	575	566	566	
PLASTERED	29	19	29	11	29	27	8	18	16	16	16	
SODAASH	29	20	259	275	218	429	289	270	359	400	400	
PIGMENTS, IN SMALL QUANTITIES	193	77	78	63	59	56	52	55	55	55	55	
SESAME, SEED	158	160	130	100	90	120	119	99	120	120	120	
SAPLINGERS, SETO	69	209	421	329	292	273	538	319	510	570	570	
WATERMELONS	281	426	299	282	318	349	276	329	313	250	250	
CARAWIPES	152	170	181	207	213	213	171	187	203	200	200	
Tomatoes, green	494	940	859	1,000	1,001	1,079	1,127	1,079	1,079	1,079	1,079	
PEPPERS, GREEN	117	211	186	439	446	411	339	326	491	514	514	
ONIONS	801	1,020	1,073	1,076	1,060	2,077	1,077	2,077	2,077	2,077	2,077	
STRAWBERRIES	311	118	122	100	100	96	96	96	96	96	96	
GUAVAS	703	1,036	1,116	1,093	1,084	832	1,201	911	832	832	832	
PINEAPPLES	210	350	270	210	210	210	479	479	479	479	479	
EGGS	82	100	160	191	210	220	203	206	250	400	400	
COFFEE	157	192	204	222	213	237	252	222	216	220	220	
COCOA BEANS	22	23	29	38	37	31	31	35	36	36	36	
MEAT, BEEF	10,9	11,9	12,2	10,5	10,0	10,0	11,5	12,3	12,0	12,0	12,0	
CATTLE, CROPS 1/	937	937	916	933	933	1,056	998	913	813	813	813	
CATTLE, IMPORTS 1/	117	12	10	21	35	63	113	76	21	21	21	
BEEF AND VEAL	99	99	981	703	747	866	869	918	976	1,030	1,030	
BURR AND LAMB	206	317	351	399	396	359	370	369	353	353	353	
PEKIN DUCK	4,110	5,044	5,711	6,070	6,220	6,531	6,619	6,700	6,816	6,909	7,001	
INDICES OF PRODUCTION						(1961-65 = 100)						
CROPS	100	125	133	127	137	139	146	146	151	151	151	
TOTAL AGRICULTURE	100	126	134	133	131	131	131	132	132	132	132	
TOTAL FOOD	100	137	146	141	152	158	166	166	170	170	170	
PER CAPITA AGRICULTURE	100	100	102	98	100	100	94	94	95	92	91	
PER CAPITA FOOD	100	100	100	100	100	103	112	109	103	105	101	
INDEX OF POPULATION 1961-65 POPULATION 39,940,000	100.0	126.0	131.3	130.9	133.6	135.3	137.6	137.6	137.9	137.9	137.9	

B. Domestic Raw Material Supplies

Agricultural production in rank order by metric tons was highest for sugar cane, corn, milk, oranges, and sorghum. These crops and others (see Table V) are the basic raw material supplies for the agro-industrial subsector.

Table V also shows indices of per capita agricultural and food production. In recent years, per capita agricultural input has fallen substantially below the 1961-65 average (see also Figure 1). Per capita food production, after rising in the late 1960's and early 1970's, began to decline in the middle of the decade to the point where present per capita food production is about even with the 1961-65 level.

This essentially stagnant agricultural situation is a primary motivation for the recent spate of rural development plans and, in particular, the Mexican Food System (Sistema Alimenticia Mexicana--SAM) plan. The erosion of agricultural gains is also a major factor in recent increases in Mexican food imports, particularly from the United States.

As described below, the stagnation of domestic agricultural production (for example, in sugar) is a primary constraint to agro-industrial expansion.

C. Imports and Exports

Table VI shows imports and exports of agricultural and agro-industrial products for the first eight months of 1979 and 1980. Major agricultural exports (by value) are coffee, shrimp, cotton, tomatoes, and other fresh vegetables. Major processed exports are clothing, frozen strawberries, prepared fruits and vegetables, roasted coffee, and cotton thread.

Revenues from petroleum exports have cushioned the impact of recent poor performances in the agricultural and agro-industrial sectors, especially in grains (corn and sorghum in particular) and processed milk. Current major imports are sorghum, pulp for paper, corn, wheat, and paper and paper cartons. Beans, processed milk, animal and vegetable oils and grease, prepared animal feeds and oilseeds are also important imports. Mexico has also recently become a net importer of flour and cornmeal. Imports of sorghum, pulp for paper, and processed milk, among

Table 6: Principal Mexican agricultural/agro-industrial exports and imports (first eight months of 1979 and 1980)

<u>Exports (FOB)</u>	<u>Tons</u>		<u>Thousands of Dollars</u>	
	<u>1979</u>	<u>1980</u>	<u>1979</u>	<u>1980</u>
Tomatoes	374,823	357,984	193,621	175,059
Vegetables and other fresh products	343,878	382,408	125,652	145,271
Cattle (live)	n.d.	n.d.	18,535	50,836
Garbanzo beans (chick peas)	69,267	47,074	58,999	34,894
Sesame seeds	74,010	30,386	54,376	26,711
Melons & watermelons	204,622	196,192	60,561	81,610
Fruits (fresh)	100,077	94,048	13,166	11,348
Strawberries (fresh)	13,928	4,906	8,287	4,123
Coffee beans	135,993	95,385	425,254	342,465
Cotton	100,929	91,042	144,755	157,072
Tobacco leaves	14,073	15,900	26,573	32,184
Honey	39,081	27,067	28,772	21,841
Sesame milk	12,635	12,890	12,571	14,108
Meats (fresh, refrigerated & frozen)	6,679	5,986	10,622	9,204
Cocoa beans	2,023	1,494	6,717	4,478
Wild lettuce (ixtle)	8,093	2,601	5,912	3,053
Cotton (unprocessed)	6,200	6,100	2,860	2,905
Gum	473	218	2,741	1,291
Shrimp (fresh, refrigerated & frozen)	15,195	14,751	170,128	164,899
Lime oil	423	1,486	10,458	10,696
Alcohol & alcoholic extracts	5,178	4,158	8,846	7,242
Fruits & vegetables (prepared or canned)	54,394	58,229	32,937	41,705
Strawberries (frozen, with or without sugar)	63,136	43,201	40,382	30,184
Tequila	19,211	20,824	15,219	21,804
Beer	39,452	57,167	13,278	18,257
Coffee beans (roasted)	2,303	3,948	8,184	16,935
Pineapple packed in syrup/juice	19,185	13,425	9,235	6,945

Table 6 (Continued)

<u>Exports (FOB)</u>	Tons		Thousands of Dollars	
	1979	1980	1979	1980
Orange juice	9,339	5,348	10,423	4,875
Abalone (canned)	653	391	6,311	4,418
Cloth articles & fabrics (cotton & vegetable fibers)	4,284	3,196	22,037	25,151
Threads, yarns (henequen)	43,135	22,013	28,081	24,027
Threads, yarns (cotton)	6,729	4,302	19,065	15,682
Textile fibers (artificial, synthetic)	3,887	4,004	10,381	10,349
Cotton fabrics	2,624	2,172	9,852	8,986
Footwear (leather, other animal)	2,647	2,287	22,324	22,629
Articles of leather or other animal hide	329	235	4,919	3,573
Tanned cowhide	176	79	1,667	786
Molasses (from sugar cane)	431,486	286,341	39,620	28,398
Wooden furniture and articles	10,137	8,600	22,610	21,037
Cocoa butter	3,399	2,654	16,857	16,421
Millet, sorghum & heather (unprocessed)	5,650	6,421	8,902	9,226
Total			1,731,690	1,632,678

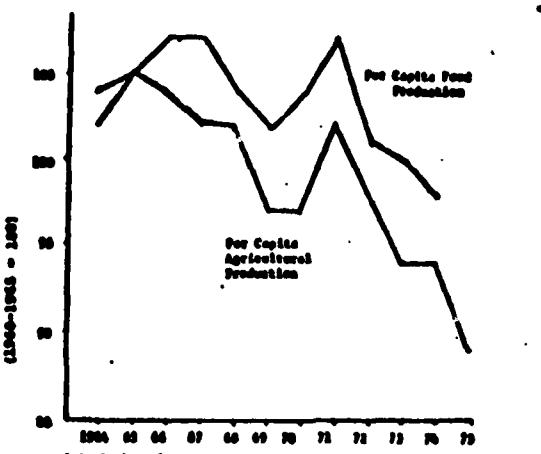
Imports (CIF)

Corn	362,677	2,134,590	44,770	339,529
Wheat	739,202	499,884	104,434	106,773
Other cereal grains			96	2,149
Milk (powdered, evaporated or condensed)	69,413	143,889	36,660	97,074
Sugar	n.d.	105,282	2	79,770
Beans	1,439	124,810	730	61,850
Beverages	14,362	13,962	17,135	30,170
Clothing and accessories	6,107	6,455	67,073	112,692

Table 6 (Continued)

<u>Imports (CIF)</u>	Tons		Thousands of Dollars	
	<u>1979</u>	<u>1980</u>	<u>1979</u>	<u>1980</u>
Fertilizers (agricultural)	716,238	446,755	65,084	64,333
Natural & synthetic resins	25,926	34,541	39,862	60,175
Sorghum (unprocessed)	908,165	1,676,374	109,422	236,545
Oil producing seeds & fruits	490,839	490,819	135,216	145,850
Paper & cardboard	82,718	208,120	52,788	128,164
Paper pulp	316,880	411,951	68,301	113,930
Animal & vegetable oil	58,533	133,013	45,471	87,707
Natural rubber	35,850	37,240	40,320	53,182
Animal feed	45,477	142,061	13,350	39,167
Newspaper	46,652	91,755	16,140	38,517
Untanned hides	38,180	31,017	53,111	37,766
Barley	11,697	152,791	1,897	27,825
Wool	3,941	4,519	14,259	19,608
Fish meal	27,416	15,354	9,855	6,932
Tractor parts (agricultural)	n.d.	1,648,716	103,194	145,800
Farm machinery	20,339	28,498	62,337	102,316
Total			1,101,507	2,137,824
Exports			1,731,690	1,632,678
Imports			1,101,507	2,137,824
Net Balance			630,183	-505,146

Source: Comercio Exterior (Vol. 30, No. 10, Mexico, octubre de 1980)



* Agricultural production includes production of food crops and livestock for human consumption (after accounting for agricultural commodities and imports used in agricultural production) as well as tobacco, industrial oilseeds, rubber, tea, coffee, and vegetables.

Source: Statistical Abstract of Latin America, Volume 16 (1977).

Figure 1.--Per capita food and agricultural production in Mexico

others, are expected to increase in the future, although plans are underway to expand the wood products industry, and price policy reforms promoting production may occur in the dairy industry. Corn and wheat imports, presently high due to recent poor harvests, are expected to level off in the medium term.

D. General Nature of Agro-Industrial Activities

1. Management

Managers of agro-industries in Mexico are faced with a variety of constraints and problems, many of which are beyond their control. These include government control of raw materials and finished product prices, unavailability of raw materials, transportation bottlenecks, and lack of adequate import availability and storage capacity. Managers of parastatal, or government-owned, businesses face the same constraints as those in the private sector, but appear to be able to resolve their problems more readily than those managing private enterprises. The overall responsibility of parastatal managers is more complex, visible and critical to the national economy than that of most private sector managers. Inadequate performance of the state-owned food purchasing, distribution and sales entity, CONASUPO, for example, is more noticeable and brings a much more public reaction than a poor performance by a private miller who cannot arrange adequate transport for his products.

Agro-industrial activities in Mexico are seldom integrated forward from the agricultural producer. Thus farmers own and operate few agro-industrial enterprises. Efforts are being made by the government under new programs to promote ownership and control of agro-industrial operations by farmers through cooperatives and ejidos (peasant collectives), but little progress has yet been made. There is substantial integration backward by private and parastatal agro-industrial firms. This backward integration mainly involves larger producers and is achieved primarily by contracts between the agro-industrial firms and agricultural producers. Such integration is more pronounced for crops processed for international markets, such as coffee, than for crops destined for local consumption, but also occurs in the sugar industry (where government price policy has driven out most private processors) and in the hops production/beer manufacturing industry.

In general, the quality of management and entrepreneurship is a major constraint affecting agro-industrial expansion. Many operations lack effective managerial systems and the technology, organization and capital to move beyond the present scale of their operations, especially if such change were attempted rapidly. Having worked through the many problems involved in raw materials supply, general processing operations, and marketing at their present levels of output, most small and medium-sized firms would meet a host of new constraints in attempting to substantially expand their operations. Such impediments, while not impossible for some managers to overcome, would seriously tax the skills and experience of many others.

As a result of these constraints, most of Mexico's agro-industrial establishments are small and exhibit low productivity. As such, they constitute a weak link in the Mexican food system. Lack of a dynamic small-scale agro-industry has, by omission, handicapped overall agricultural development.

2. Finance

At the present time, according to a Mexican government estimate, perhaps two-thirds of Mexican small- and medium-sized enterprises have not used banking system credit. Along with lack of technical assistance, this has proved to be a major constraint to these firms' expansion. To overcome this obstacle, the Mexican government has recently made a significant commitment to expanding public credit services.

The major institutions offering credit to small- and medium-sized enterprises include three trust funds administered by the government-controlled investment bank, Nacional Financiera, and the Banco Nacional de Credito Rural. These institutions, with increasing government and external donor support, appear to be reducing the financial constraint on small-scale agro-industrial expansion. For example, the Agro-Industrial Trust Fund is making loans at effective interest rates well below the current inflation level. Banco de Mexico has also required private banks to allocate an amount equal to at least two percent of deposits to be lent to small and medium enterprises. Some banks such as BANAMEX have already established special programs to assist small enterprises. However, to date these efforts have been relatively modest, and limited access of small and medium firms to credit is likely to persist for several years.

3. Technology

The technology used in the agro-industrial subsector ranges from highly advanced to rudimentary. In general, however, the technology used in most agro-industrial operations is intermediate in nature, drawn from developed countries and appropriate to the scale considerations and maintenance capability in Mexico.

The technology used in agro-industry is usually combined with substantial labor intensity. The resulting agro-industrial activity is most often appropriate to Mexico, whereas more capital-intensive production techniques sometimes would be less satisfactory in terms of both employment and cost effectiveness. On the other hand, the less standardized and controlled processes of the subsector sometimes result in quality and product standardization problems in both domestic and international markets. Most agro-industrial operations aimed at satisfying international market demand, such as fruit and vegetable processing in the Northwest, use more advanced technology, monitor labor inputs carefully, and thereby achieve international product quality at competitive costs under Mexican operating conditions. This achievement appears to result primarily from lower-cost raw material supplies and better management of processing operations, however, rather than from the mere use of more modern processing technology.

Mexico is now gearing up to enhance the growth and performance of its agro-industrial subsector. Nacional Financiera, the country's principal investment bank, has created the Programa de Apoyo Integral a la Industrial Mediana y Pequena (PAI) to coordinate financial and technical assistance to small-scale industrial enterprises, many of which are agro-industrial in nature. The Plan Nacional de Desarrollo Agroindustrial 1980-1982, recently drafted by the National Commission for Agro-Industrial Development, a coordinating body for 14 ministries and other government agencies, seeks to coordinate state activities in the agro-industrial area and integrate them with other economic development efforts. The launching of the SAM should give added impetus to agro-industrial development, inasmuch as SAM emphasizes the creation of rural, small-scale food production processing and distribution systems designed to boost rural, low-income people's nutrition and employment levels.

In seeking to promote growth and productivity in the agro-industrial subsector, Mexico should be able to utilize small-scale technology in a wide variety of areas, especially in meeting needs of local markets.

Efficient, advanced smaller-scale technologies are available in such areas as fruit and vegetable processing, animal feed mixing, fish processing, saw-milling, maize milling, rice milling, baking, charcoaling, oilseed crushing, etc. More emphasis on and experience in such technologies is becoming available annually from domestic and foreign sources. Mexico is liberalizing its terms for admitting foreign-held technology, and is willing to pay higher prices for them to boost domestic industrial productivity. Given these developments and experience, and the focus of SAM on directly meeting the food and employment needs of low-income rural people, the potential for fruitfully applying new technology in Mexico clearly exists.

However, the maintenance and efficient use of processing and manufacturing equipment in the sub-sector on a consistent basis is difficult. Part of the problem is lack of training and mechanical knowledge on the part of those responsible for plant operations. Another element is the general lack of preventive maintenance in many small and medium-sized operations. Also, some of the equipment used requires spare parts or even skilled assistance from long distances or even from outside Mexico. The process of obtaining spares or skilled assistance is sometimes extremely slow, especially in rural areas.

Since the beginning of the Lopez Portillo administration, the GOM has increased the number of import permits granted for foreign capital goods. The increased priority of rural and agro-industrial development may well signify an opportunity for U.S. exporters of food processing equipment and related technology.

There are some areas in which choice of technology will be more important than in others, i.e., in some industries technology is fixed, in other areas wide choice exists and a particular choice has implications for a product's international marketing potential. The technology variable will be important in such areas as tobacco curing, orange juice production, sugar production, oilseed crushing, charcoal making, and the entire range of forest-related processing industries. For these and other cases, there are either specific standard types of levels of technology which are required for Mexican producers to compete internationally (e.g., orange juice concentrate production) or a wide range of technologies from which to carefully choose in further developing the product

are (e.g., charcoal making, oilseed crushing, and saw-milling). U.S. equipment and input suppliers marketing in Mexico and potential U.S. importers of Mexican agricultural products, need to keep their industry's technological characteristics in mind. U.S. producers/competitors should keep an eye on the Mexican entrepreneur's technological choice -- if standard technologies are used, then Mexican exports could potentially compete in the U.S. or world markets.

4. Pricing

Prices and price policy for many agro-industrial raw material supplies and products are either directly or indirectly controlled by the Government of Mexico. This places many agro-industries, especially in the private sector, in the position of paying fixed prices for raw materials and receiving fixed prices for their final products. Since such prices are established by the GOM with respect to considerations other than enterprise economics, a substantial cost-price squeeze for some agro-industrial operations can result.

To date, the GOM has sought to balance the prices paid to agricultural producers (who want higher prices) and those paid by consumers (who want lower prices). In some sectors, however, this balance has not been maintained. In the early 1970's, for example, sugar prices to growers increased (by 190 percent) until they were equal to the plant gate price at the sugar refinery. Most private sugar refiners found it impossible to operate their plants as a result, requiring GOM subsidies or simply going out of business. Similar pricing policies in the fertilizer and other sectors, particularly those with public sector enterprises, have resulted in government subsidies as well. Such governmental pricing decisions have not only reduced or eliminated private investment in certain industries; they have also reduced much of the incentive to control costs in those public sector enterprises producing the price-regulated, but subsidized commodities.

5. Transportation

Although transportation is considered elsewhere in this report, there have been such major logistical problems in the rail and road transport systems in recent years as to require special mention here. In 1979 and 1980, Mexico required substantial grain imports from the United States to make up for domestic crop shortfalls. Railroads were so overwhelmed by this surge in traffic that much of the grain could not be moved immediately to flour mills and other processing

plants. Substantial port congestion was created leading to further inefficiencies and economic costs. As a result, the border was closed to new grain traffic for a month or more on two occasions during this period.

Similar, but less onerous, transportation difficulties affect most agro-industrial operations. These problems make it hard to move raw materials and finished products efficiently and reliably within the agro-industrial subsector.

E. Markets

1. Domestic

The domestic market for agro-industrial products is large in Mexico, and therefore a major factor in influencing the development of agro-industrial activity. Also, with a population of approximately 70 million (1980 estimate) 3/ growing at a rate of 2.9 percent per year and a per capita income of \$1,437 (in 1978 dollars) and \$1,785 (in 1979 dollars), the domestic market is expanding rapidly. Domestic demand for agro-industrial commodities is expected to grow at annual rates varying from 3.6 to 10.0 percent during the 1978 to 1982 period. For the 1982-1990 period, average annual rates of growth in domestic demand are projected to be as follows:

	<u>Percent</u>
Wheat and milk	7.8
Flour and cornmeal	2.6
Other foodstuffs	6.0
Soft textile fiber	11.5
Shoes and garments	14.2
Lumber and cork	12.0
Paper products	11.1
Fertilizers	10.0 <u>4/</u>

3/ Used elsewhere in the report. Some estimates are as high as 73 million.

4/ Industrial Development Plan, 1979-1982-1990.

This expected rate of overall growth in domestic demand for agro-industrial output will have to increase apace during the 1980-1990 period. In turn, this will require that constraints in the areas of management, transportation, marketing, etcetera discussed above, must be overcome on a continuous basis.

2. Exports

The Mexican government expects agro-industrial exports to increase in some areas and decrease in others. Expected annual rates of change during the 1979-1982 period range from a 0.8 percent per year decrease for "other foodstuffs" to a 21.2 percent increase for "shoes and garments." For the 1982-1990 period, projected annual rates of change in total exports are as follows:

	<u>Percent</u>
"Other foodstuffs" (excluding wheat, milk, flour, and corn meal)	- 20.8
Soft textile fiber	12.9
Shoes and garments	21.2
Lumber and cork	- 0.1
Paper	9.8
Fertilizers	9.0

Particularly Mexican agro-industrial products, of course, have varying export potential. Processed olives, for example, appear to offer substantial potential for export to the United States, as do some processed fruits and vegetables and numerous other products. Other agro-industrial commodities will have less export potential, either because of external market conditions or increasing internal demand.

F. Summary

The above data illustrate both the past performance and the importance of agro-industry in the manufacturing sector of Mexico. Agro-industry has grown rapidly (4.4 percent annually) in recent years, contributing to the overall growth of the manufac-

turing sector and both encouraging and responding to growth in the agricultural sector. Growth in agro-industry will continue to be important in the future, given the continued central role of agriculture in the economy and its contribution to the well-being of much of Mexico's population. The relatively large size of Mexico's domestic market for agro-industrial products will encourage additional agro-industrial activities.

Growth of agro-industry will exacerbate some already apparent problems -- e.g., transport difficulties, inadequate raw material supplies, water shortages, product quality problems, and managerial difficulties, especially among the many small and medium-sized firms. Discussion of these constraints appears in Section IV.

On the other hand, growing agro-industrial activities will provide linkages to and momentum for small-holder and general rural development (a priority of the GOM), providing additional employment and income, expanding the market for non-agricultural products and helping to increase the quality of life of people in the rural sector.

Despite the many obstacles (discussion of which appears in Section IV), prospects for Mexican agro-industrial growth appear good. The country's burgeoning petroleum revenues promise the availability of capital for the investment needs. Most of Mexico's agro-industrial activity depends upon a renewable resource base that, if well-managed, can continue supplying raw materials indefinitely at reasonable real costs.

To overcome the remaining obstacles, the GOM has initiated a series of coordinated planning efforts, including the National Agro-Industrial Development Plan for 1980-1982. The agro-industrial plan is discussed in detail in the following section.

III. NATIONAL PLAN FOR AGRO-INDUSTRIAL DEVELOPMENT

The National Plan for Agro-Industrial Development, released in early 1980, sets the goals and parameters for agro-industrial development in Mexico. It is intended to regulate public sector actions and to provide incentives to the social and private sectors. It was designed by an inter-agency task force,

the National Commission of Agro-Industrial Development, which represents 14 federal government departments and agencies. The Plan draws upon and, in terms of goals, is consistent with co-existing development plans such as the Global Development Plan, Mexican Food System Plan (SAM, "Sistema Alimentario Mexicano"), National Employment Plan, National Agriculture and Forestry Plan, etc. It does, however, represent a departure from the earlier released Industrial Development Plan, because it indicates an increased level of investment for the agro-industrial sector. This section discusses the Plan's three-year goals and objectives, proposed programs, and the resources to be made available in 1980.

A. Goals for Agro-Industry

The goals identified by the National Plan for Agro-Industrial Development are to:

- achieve self-sufficiency in basic agro-industrial goods, both food and non-food;
- raise employment levels in rural areas;
- increase the incomes of communal and individual smallholders;
- establish a productive agro-industrial base that supports a harmonious and integrated rural development;
- improve the diet of the poor;
- develop an efficient technological and organizational structure in the agro-industrial sector; and
- reduce the country's balance of payments deficit.

There are several supporting objectives designed to help achieve these goals. Thus, the Plan has decreed that the agro-industrial subsector will grow at an 8.0 percent annual rate and;

- contribute to the national goal of the GNP growing at approximately 8 percent annually over the 1980-82 period;
- contribute to achieving the nutritional goals of the SAM -- 2,750 calories and 80 grams of protein per person per day;

- contribute to the goals of the National Employment Program (which are to lower underemployment to 40.8 percent from 44.4 percent, maintain the under-employed population at the same absolute level, and create 751,000 jobs per year); and

- assist agricultural production to reach the goal (enunciated in the National Agricultural and Forestry Plan) of 4.2 percent annual growth.

In achieving these objectives and goals, the Agro-Industrial Development Plan will provide support for the desired annual growth rates indicated in the Global Development Plan, which include the following:

- gross domestic production, 8.0 percent
- total private consumption, 7.7 percent
- gross fixed capital formation, 13.0 percent private, 14.0 percent public
- employment, 4.2 percent

B. Criteria and Means of Implementation

The plan includes numerous criteria to guide GOM activity in the agro-industrial subsector. Because they help indicate the specific focus of the plan, abbreviated versions of these criteria are listed here:

- strengthen peasant-owned agro-industry;
- emphasize state intervention in strategic activities, regions, and products;
- support the organization of communal and individual smallholders in ways which better their terms of trade vis-a-vis middlemen and processors;
- favor social sector participation in agro-industry (and hence magnify opportunities for collective work organization);
- favor national as opposed to foreign ownership, limiting foreign investment to activities which would not endanger national sovereignty;
- improve the nutritional levels of the poor;
- guarantee agro-industrial inputs to boost production;

- improve the production of basic, non-food consumer goods (e.g., textiles, oils, leather goods, etc.);
- raise employment and income levels through promotion of small-scale agro-industries close to where raw materials are produced;
- promote regional decentralization towards areas identified by the Industrial Development Program and the National Plan for Depressed Areas and Marginal Groups (Plan Nacional de Zonas Deprimidas y Grupos Marginados); and
- promote the legal and economic integration of agro-industrial processes in such a way as to promote peasant participation.

Numerous mechanisms will be used to fulfill the goals and objectives of the Plan. The most important of these are: (1) credit and finance (similar to the present system in the agriculture, livestock and forestry sector); (2) fiscal incentives and regulations (existing legislation); (3) public investment and spending; (4) marketing policy to strengthen and expand state distribution channels; (5) regulation of foreign investment and businesses; (6) scientific and technological development oriented toward the nutritional, employment, and other needs of the rural and urban poor; (7) democratic organization of producers and efficient integration of production process; and (8) improved public administration (promotion, organization, technical assistance, production, marketing, etc.), coordinated by the newly-created National Commission for Agro-Industrial Development.

The plan encompasses six programs, which include 19 subprograms and 70 projects. These six programs and their 1980 public sector budget allocations are:

U.S. \$ (at MexP25/US\$)

Program for Definition, Management and Coordination of Agro-Industrial Policy	\$ 22,049,640
Program for the Development of Food and Non-Food Agro-Industry	5,097,363,324
National Agro-Industrial Investment Project Inventory Program	21,265,092

Agro-Industrial Promotion Program	4,664,520
Operational Assistance Program	10,432,840
Agro-Industrial Information and Methodological Support Program	<u>9,633,560</u>
TOTAL	\$ 5,165,408,976

C. Public Sector Resources and Private Sector Incentives

Several GOM agencies share the 1980 public sector resources devoted to the achievement of the National Agro-Industrial Development Plan. The allocation of 1980 resources among these agencies is as follows:

<u>U.S. \$ (at MexP25/US\$)</u>	
Secretary of Agriculture and Water Resources	\$ 552,359,120
Secretary of Finance and Public Credit	2,193,201,960
Secretary of Programming and Budget	4,307,924
Secretary of Patrimony and Industrial Promotion	2,007,467,080
Secretary of Commerce	403,535,840
Secretary of Labor and Social Planning	451,052
Secretary of Agrarian Reform	<u>4,086,000</u>
TOTAL	\$ 5,165,408,976

Of this total amount, over 99 percent is being devoted to the parastatal sector, the remainder of the budget being allocated to central sector activities.

Agro-industrial investments in the social and private sectors will be eligible for the same incentives as are other manufacturing entities, and vary

according to where the enterprise is located. These incentives include preferential tax treatment, lower energy rates and tariffs, subsidized loans, additional capital sources, and coordination with public sector procurement programs.

In addition, social and private sector investments are eligible for diverse additional (but unspecified) support if they satisfy one of the following two criteria outlined by the Plan:

- Investors must satisfy two of the following criteria based on:

- ownership/organization (preference given to ownership or structuring of enterprise favoring small farmer investment);
- type of good produced (basic needs favored);
- employment/income generation;
- regional development/decentralization; and
- forward and backward linkages to peasant-owned enterprises.

- Those eligible must surpass minimum requirements for the program (regarding production volume, price, social characteristics of distribution channels, etc.).

D. Summary

The Agro-Industrial Plan is consumer-oriented, particularly toward the rural poor. It seeks to assist them through raising nutrition levels, providing employment and increased income, and involving the campesinos through their participation and control in social forms of organization (cooperatives, ejido factories, etc.).

The primary focus of the Plan is on achieving national self-sufficiency in the production, transformation and distribution of processed agricultural products. Some reference is made to exports, but only in situations where production already satisfies domestic consumption. Import substitution receives substantial attention.

In particular, the Plan seeks to improve the productivity and efficiency of the agro-industrial

activities linked to the target producing and consuming population, i.e., the rural (and, to a lesser extent, urban) poor.

Mexico's agro-industrial and other development plans, oriented as they are to a domestic audience, emphasize domestic political concerns, i.e., boosting production among ejidos and individual smallholders to attain food self-sufficiency and more equitable distribution of development benefits. In light of Mexico's perceived past exploitation by and dependence on agribusiness and on foreign interests, it is impolitic for the GOM to include export concerns in these programs. While certainly not discouraging agro-industrial exports, the GOM does not encourage them either within these plans. If Mexico is to increase its agro-industrial exports to the United States in the next five years, it will be primarily due to private sector initiative, not government efforts.

IV. POTENTIAL FOR FURTHER AGRO-INDUSTRIAL DEVELOPMENT

Mexico has substantial potential for further development of agro-industry, both for the domestic market and for export. The performance of agro-industrial enterprises will be determined primarily by a number of factors, including (1) raw materials availability, (2) markets for agro-industrial products, and (3) the internal capabilities of individual agro-industrial enterprises.

A. Raw Material Supplies -- Prospects and Problems

The principal physical constraint affecting the growth of agro-industry is lack of adequate raw material supplies. The provision of adequate agro-industrial products depends, in part, upon the sufficient availability of appropriate quality raw materials at the correct time and place for processing. These raw material inputs include diverse crops, livestock, fish, and forestry products, as well as some other further processed products (e.g., phosphates for fertilizer).

Mexico's agricultural output has grown too slowly in recent years to improve per capita food production,

as indicated earlier in Figure 1. During the 1970's, the average annual growth rate for the sector was two percent, well below the rate of population growth, and is expected to be one percent in 1980. Its contribution to GNP fell from 11 percent in 1970 to about 8 percent in 1979. In the case of important commodities like corn, wheat, sorghum, and dry beans, the agricultural sector has not been able to eliminate imports. On the contrary, in 1980 Mexico was expected to import approximately 10 million tons of these commodities and 13 million tons of all foodstuffs.

The lack of growth of Mexico's agricultural output is a result of factors affecting both its modern and traditional agricultural sectors. In the modern sector, numerous factors reduced growth: lack of new water supply systems, poor design or performance of those systems that were put in, exhaustion of most of the potential of the green revolution, the impact of inflation on input costs (especially in livestock), and certain policy measures (e.g., the embargo of cattle exports coupled with drought conditions that reduced the cattle-carrying capacity of the land, the price controls which made sugar processing unprofitable and drove many private firms out of business, etc.). Severe drought conditions have also influenced agricultural output in both the modern and traditional sectors in the last few years.

The traditional sector has experienced inadequate progress in boosting output during the past decades because of a lack of sustained attention and available resources to alter the input mix, management, and incentive structure faced by small farmers and the collective ejidos.

These output problems have created major food import requirements (mainly basic grains, beans and oilseeds) which have clogged Mexico's transport system, and contributed to rural-urban migration. Most importantly, they raise the politically sensitive spectre of food dependence (primarily on the United States). Lack of adequate output in the agricultural, fisheries or forestry sectors also decreases both the need and opportunity for agro-industrial activity based on domestic production, especially in rural areas. 5/

5/ If agro-industrial enterprises depend on imported supplies, they tend to be larger, more centralized, and in urban, as opposed to rural, areas.

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Eliminating this supply bottleneck and enhancing agro-industrial development will require two things: (1) removing transportation bottlenecks and (2) implementing an effective approach to increase output in both the traditional agricultural sector and in the modern agricultural sector. Removing transportation bottlenecks in railroads and ports is currently the objective of a major government investment program. Improving productivity in the traditional small farmer sector is clearly possible given costing technology and resources, although it must be seen as a long-term effort. Mexico's modern agricultural sector is less amenable to major productivity breakthroughs, but a reorganization of resources and concentration of effort in some sectors could create increased output. This is especially true where conscious efforts are still being made to achieve lower-cost production by use of land and labor with fewer off-farm inputs (such as fertilizer or pesticides) per unit of land than used in comparable areas in the United States.

How Mexico's agricultural sector will perform depends to a great extent upon domestic agricultural policies, as well as the weather. Current policies are moving toward improving the lot of the traditional farmer, the campesino. Of course, this will be a long and difficult task, but such a policy might work, and if it does, could bring about an enduring change in the countryside. To do so implies a radical change in the very structure of Mexican agriculture and agro-industry.

B. Markets -- Prospects and Problems

Markets for Mexico's agro-industrial products were indicated in a general way by the import-export data presented earlier. Substantial domestic demand exists for specific agro-industrial outputs such as forestry products, milk, meat and fish products, processed vegetables, sugar and honey, processed fruits and fruit juices, agricultural and flower seeds, cotton cloth, leather goods, paper products, animal and vegetable oils, prepared consumer food items, animal feed ingredients, bakery items, agricultural machinery, etc. Population and income growth will continue to fuel new demand for these and other agro-industrial products. If the major rural development projects underway result in higher incomes for rural people, effective demand for such products will rise even more rapidly.

Under current development plans, emphasis is placed upon providing basic consumer food items to all who need them. This will tend to focus agro-industrial development efforts on grain milling (corn, wheat, rice, etc.) and grinding, animal feed manufacturing, bakeries, edible oil processing, sugar refining, textile production, drink processing, and milk, meat and fish processing. There is a substantial and growing domestic market for the products of such agro-industrial activities. If small-scale rural agro-industrial processing enterprises can be established, they will enjoy substantial local demand for many of these products. These facilities could be relatively more labor-intensive than larger, more centralized operations and could also provide employment in the less-developed rural areas of Mexico.

Expanding export markets also exist for some agro-industrial products provided by Mexico. Fresh and processed fruits and vegetables -- strawberries, pineapples, tomatoes, olives, etc. -- are central items which Mexican entrepreneurs have made known they will increasingly market abroad. Such products will continue to be in demand in the United States, Japan and other developed country markets. Leather goods, cotton and textiles, processed fish products, alcoholic beverages and fruit juices, clothing, molasses and honey, paper products and wooden articles may also find available markets among Mexico's export partners.

The market for Mexico's agro-industrial products does not appear to be an impediment to its rapid development. The domestic market for most agro-industrial products will grow rapidly. Only the unequal distribution of income among the entire population and logistical difficulties will keep growth of effective demand below the levels it could achieve.

Expansion of exports of Mexico's agro-industrial products will be limited mostly by internal demand requirements, rather than by limited markets abroad. However, quality control, market access, and internal production capability -- rather than costs of production -- are likely to limit exports somewhat. Mexico's trade relations and use of export promotion policies could influence the access it is able to obtain for its agro-industrial products in export markets.

However, access to export markets for agro-industrial products, especially in the United States, may prove to be difficult for newly-established or

expanding Mexican firms. U.S. and other multinational food companies in Mexico predominate in the food industry and in agro-industrial export activities. If agro-industrial exports are effectively emphasized, as suggested by the Industrial Development Plan (but not by the Agro-Industrial Plan) these internationally-oriented firms are likely to control them. This may be advantageous to Mexico as a whole if one considers that substantial export expansion may depend upon the marketing power of such firms in the major markets. On the other hand, the pervasive domestic market position of these firms, coupled with their control of export channels, could result in leaving merely the marginal aspects of the domestic market to Mexican-controlled agro-industrial firms. Whether via the major firms or through other channels, Mexico will certainly want to use its increasing stature as a major oil producer to press the United States for expanded markets for its agro-industrial exports.

C. Performance of Individual Agro-Industrial Enterprises -- Prospects and Problems

The agro-industrial system envisioned to support Mexico's planned agricultural and industrial expansion is extensive and complex. The expanding role of the GOM in agriculture and agro-industry as called for in the SAM and the Agro-Industrial Plan will provide credit, a supportive policy framework, and encouragement to individual raw material producers and processors. It is likely that GOM emphasis on the development of rural industry will lead to support for technologies appropriate for small-scale agro-industrial enterprises. However, the real difficulty in assisting existing and potential individual agro-industrial enterprises goes beyond these constraints. Management, technical assistance, and equity capital requirements are the three predominant internal factors that will constrain individual firm expansion, especially among individual and cooperative/ejido entrepreneurs in the traditional rural areas of central Mexico. 6/ New enterprises, particularly those located far away from high-quality support systems such as finance, transport, maintenance and repair facilities, are the most difficult to manage successfully. Local entrepreneurs may not exist in such areas and are difficult or impossible to attract from other areas. Systems for channeling credit to small entrepreneurs are inadequate; in particular, adequate local equity capital is often lacking.

6/ This is not as great a problem in the "modern" sector of the east and west coasts.

GOM involvement with local farmers in creating agro-industrial enterprises could be a fruitful approach, and it is one that the World Bank and others support. Success will require a comprehensive GOM assistance package, however, and it is unlikely that government personnel presently possess the critical skills needed to implement the aspects of the package that are most important. Also, whatever degree of success this approach achieves in boosting rural incomes and nutrition levels, it is unlikely to provide the bulk of Mexico's agro-industrial output requirements or realize a substantial portion of the agro-industrial potential that exists. Mexico is too urban a country -- over 60 percent of its people live in cities and towns - and its traditional rural sector is too marginal for the traditional sector to take the lead in agro-industrial development.

For satisfying Mexico's agro-industrial needs and maximizing its agro-industrial potential, the country must depend on the modern sector, which is composed primarily of large- and medium-sized private agribusinesses. This is because management, marketing, and technical knowledge, which is most critical to successful enterprise expansion and which is most scarce in Mexico, is the province of the modern private sector. This is a fact recognized by the government in the strong bid for private sector involvement made in the Industrial Development and Agro-Industrial Development Plans.

Assuring the profitable use of these privately held organizational and technical skills in the service of national development goals will be the largest challenge faced by the GOM in the future. However, while the large private firms are expected to respond to fiscal incentives in their own expansion activities, no provisions (so far as we know) have been explicitly made to encourage any transfer of technology or management skills to small-scale firms in the traditional sector. Technical assistance will be undertaken on a limited basis by government agencies, but this is clearly inadequate.

Another factor constraining Mexican agro-industrial development is lack of credit. This is less a problem for the larger, more integrated agribusinesses of the Northwest and more a problem for small-scale, particularly rural-based firms, at least for the present. Current credit mechanisms are inadequate, though growing. World Bank and other external donor support, added to domestic sources, are

presently enabling the banking system to extend more credit to small, rural borrowers.

Current agro-industrial development plans call for parastatal enterprises to be rapidly expanded. These firms will face the same operating constraints as private firms, but will enjoy the luxury of subsidized operations. Some operating guidelines should be implemented by the GOM which would stimulate these parastatal enterprises' efficiency and justify (in economic terms) their existence alongside the private sector. These reforms might include requiring that they earn at least some of their expansion capital, that they keep production costs in line with revenues, and that they be permitted to adjust product prices upward when legitimate production cost increases occur.

In sum, we can say that an important factor affecting future agro-industrial development in Mexico will be the degree to which it increases the amount of management, marketing and technical knowledge in its industrial sector, particularly among small-scale firms. Efforts to encourage and involve the domestic private sector in meeting agro-industrial development goals are necessary but not yet apparent. Success in channeling multinational agro-industrial company activities toward contributing to the national development goals of raising domestic nutrition/consumption levels will also help. Development of effective efforts to identify, train, and promote high-quality managers in public sector enterprises will also be of importance. The success of such efforts is not likely to become apparent for several years.

D. Summary

The central problems faced by agro-industry in Mexico are rooted in the overall industrial and economic system of the country. Transport bottlenecks, credit scarcity, raw material shortages, lack of management expertise, inadequate income levels to buy agro-industrial products and other difficulties will not be lessened rapidly. Yet they must be lessened if agro-industry is to grow and prosper. Agro-industry will expand rapidly if these difficulties are overcome. For this reason, agro-industrial activities must be viewed not only in the context of the plans for agro-industrial development, but also in the context of the total GOM development effort and the resources and efforts likely to be made by the private sector -- farmers, businessmen, and domestic and foreign consumers alike. When seen in the larger context, the

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prospects for agro-industrial expansion in Mexico are promising.

Mexico is likely to realize most, but not all, of what it plans to achieve in terms of agro-industrial growth during the 1979-1990 period. Raw material shortages, systems constraints and emphasis on decentralizing agro-industry will restrict desired growth rates. Nevertheless, the renewed emphasis given agricultural production and agro-industrial output by the GOM during the current plan period should begin a process in which agro-industry can prosper. This program is likely to create both opportunities and problems for the United States, as noted in the next section.

V. IMPACT OF AGRO-INDUSTRIAL DEVELOPMENT ON THE UNITED STATES

A. Trade

Expansion of agro-industrial activity in Mexico is likely to have two major impacts on U.S. trade. First, despite Mexico's strong desire to be self-sufficient in basic agricultural commodities, it is unlikely to become so in the near future. As domestic demand for these and other agricultural commodities grow, the United States will benefit from increased exports to Mexico. The bulk of these commodities will be basic grains to be further processed in Mexico. As Mexican agro-industrial capacity grows, both these and other commodities will be imported in larger quantities to supply Mexican firms with needed raw materials. Animal feed manufacturers, flour, rice and corn millers, bakers, milk product processors, oilseed crushers, paper makers, and furniture producers, among others, can be expected to look to U.S. suppliers for more of their raw materials in the future.

Second, Mexican exports of finished agro-industrial products to the United States can be expected to increase. These include processed fruits and vegetables (e.g., citrus sections, strawberries, pineapples, olives, lime oil), fruit juices, other processed food products, leather goods, molasses and honey, some wood and paper products, and cotton textiles. There will be increasing pressure by the GOM on the United States to accept and even to encourage these imports as a means to increase employment in Mexico and reduce immigration pressures on the United States.

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Increases in some agro-industrial exports to the United States will place more competitive pressure on certain segments of U.S. agriculture and agro-industry. Mexico's winter tomato imports (which are further processed in that they are sorted, graded, packed and "gassed" to turn them red), for example, have long been resisted by Florida's growers, packers and distributors. Although Mexico's domestic market will continue taking increased amounts of Mexican winter tomatoes (and other fresh vegetables), substantial expansion of production in Sinaloa will be for export to the United States in the 1980's. Likewise, much of Mexico's expanding table olive and olive oil output is destined to compete with California's olive industry (and to partially displace Spanish olive exports to the U.S. market). Some leather goods, clothing items, and frozen strawberries also compete strongly with U.S. suppliers, although the production of frozen strawberries, as well as canned pineapples and other fruit, has been constrained by the scarcity of domestic sugar supplies.

Increases in Mexican agro-industrial products for export to the United States will increase political pressure to break the strong hold by U.S. export agents (small trading companies and individuals) on distribution of these products to the U.S. market. These exporters to the United States often control the distribution of Mexican products to countries other than the United States as well.

B. Investment

Mexico is second only to Brazil in the amount of U.S. foreign investment in developing countries. Thirty-two of the 77 multinational food companies operating in Mexico are U.S. firms. Together, the 77 companies account for 60 percent of food industry activities. An additional 67 U.S. companies operate in areas related to agriculture, as indicated below:

	<u>Number</u>
Food	32
Pharmaceutical and chemical	35
Animal by-products	12
Machinery and farm equipment	7
Forestry and paper products	11
Seafood	2

The U.S. food products companies in Mexico represented 8.3 percent of all U.S. foreign investment in Mexico in 1978. While these firms received just eight percent of all returns to U.S. manufacturing companies on their direct investments, they received 21.8 percent of all fees and royalties (for services, licenses, etc.) obtained by U.S. manufacturing companies in Mexico.

The GOM's pursuit of expanded agro-industrial output will provide additional opportunity for these and other U.S. firms to participate in agro-industrial activities. This participation will take many forms, ranging from direct investment/joint ventures to licensing agreements and management contracts. In making a virtue out of necessity (current law requires 51 percent of Mexican ownership of investments), special attention is likely to be given to locating small indigenous firms with appropriate management potential and know-how as joint venture partners or licensors.

The return on U.S. investment in agro-industrial activities in Mexico should average about the same as in prior years. However, it is likely to become larger in absolute terms (because of the increased amount of investment in the subsector) and may become larger in relative terms as well.

The predominant position of the U.S. firms in Mexico's agro-industrial sector will result in increased political pressure to develop alternatives to "yanqui" power in the subsector. Highly visible and large-scale foreign agro-industrial operations will become increasingly uncomfortable in an environment in which smaller Mexican-controlled firms are valued and rural industries are emphasized. U.S. agro-industrial operations, then, are likely to be more successful and more helpful in meeting the needs of Mexico if they scale down their activities to the level of smaller firms and seek to meet the market needs of lower-income persons. Since the size of this market is large and rapidly growing, success in profitably meeting the basic consumer needs of these people would seem to be the most interesting, potentially profitable and politically compatible role for U.S. agro-industrial companies seeking expansion of their activities in Mexico. The challenge to U.S. firms is to develop practical and profitable ways to provide basic foods and consumer goods to the large numbers of lower-income people in Mexico.

CHAPTER THREE
CONSTRAINTS

CONSTRAINTS

I. INTRODUCTION

A. Goals Versus Performance

At a time when most of the world economy has shifted to slow growth, Mexico expects to grow rapidly. National leaders have projected that GDP will expand by eight percent per year, industry by ten percent per year, agriculture by four percent, and employment by over four percent. At the same time, Mexico's plans have been based on an inflation rate of less than 20 percent, a current account deficit equal to only slightly over one percent of GDP, greater growth for previously neglected regions of the country, and a dependence on the petroleum industry limited to nine percent of GDP and forty-five percent of exports through 1982.

Mexico has been able to maintain a high rate of aggregate growth through 1980, but statistics indicate Mexico is beginning to depart seriously from the original goals. Inflation is perhaps the most serious gauge of this departure, reaching 29.8 percent in 1980. Expansion of GDP declined from 8.5 to 7.4 percent between 1979 and 1980. Petroleum exports grew rapidly while non-petroleum exports stagnated, leaving Mexico dependent on crude oil and gas for 65 percent of its foreign exchange earnings. A rapid increase in imports, plus higher interest rates and a loss in the competitiveness of Mexican tourism, caused the current account deficit to surpass 5 percent of GDP in 1980.

In this section we analyze the constraints which impinge on Mexico's course of growth today and which will continue to do so in the future. These include problems related to transportation, skilled labor, finances, external constraints, infrastructure, and regionalism. First, however, we must place these specific impediments in a broader context.

B. "Petroleum Syndrome"

From the first, Mexico's leaders have said they

do not want to convert their nation into a mere oil exporter, yet it is also clear that they rely on petroleum as a "lever" to accelerate the growth of their economy. Many countries have already tried this strategy and developed serious problems. Is Mexico avoiding the errors of its predecessors and, if so, will it continue to do so?

Abel Beltran del Rio of Wharton Economic Research describes the "petroleum syndrome" as a set of phenomena that characterizes the development of petroleum-rich economies. They arise from the attempt to use petroleum exports as a means of achieving rapid increases in income and welfare. These phenomena include the stagnation of non-petroleum exports, an over-valued exchange rate, excessive imports, low growth in agriculture, excessive growth in the services sector, and the creation of an inefficient and uncompetitive industrial structure. As Beltran del Rio describes it, a country in the grips of the petroleum syndrome suffers from an euphoric and short-lived sense of well-being, coupled with severe imbalances which take their toll well before petroleum production declines. Such a country fails to establish a diversified, self-sustaining economy, and falls victim to a self-perpetuating and deepening addiction to petroleum largesse. Rather than being channeled into productive solutions to long-term problems, petroleum revenues are funneled into sumptuous and populistic displays which raise expectations but make their end realization all the more difficult.

Venezuela and Saudi Arabia are cited by Beltran del Rio as illustrations of one type of petroleum syndrome. These countries, with small populations and little or no industry, suddenly experienced a boost in oil income without the necessary means to use this wealth satisfactorily. During the 1960's petroleum earned nearly 50 percent of Venezuela's GDP and was responsible for 80 percent of public revenues. The oil industry was able to absorb only a small portion of the labor force. Agriculture stagnated. Industry failed to flourish in an environment of high local costs and imports made artificially cheap by a petroleum-buoyed exchange rate. Large government spending programs failed to achieve their ends either in terms of economic restructuring or social equity. Venezuela's boost in foreign earnings, following the 1973 OPEC price increase, did not hold down the foreign debt, which increased substantially. While Venezuela's industrial base has grown in recent years, it still remains a nation of imported consumer goods. Saudi Arabia is a similar -- albeit far more extreme -- example.

Iran presents a different example of the petroleum syndrome. A large country with a more generous endowment of resources and markets, it could have been expected to use oil more easily to achieve domestic industrialization as part of a comprehensive development scheme. In practice, the problems were compounded. Iranian agriculture stagnated and the rural unemployment increased, eventually feeding a bitter religious reaction. Although industry grew rapidly, it was high cost, poorly integrated, and in many cases unrelated to the needs of the country. A small portion of the population was thrust into a technological, affluent society while the majority crowded into marginal service occupations. It cannot be said that the crisis of 1978 was entirely predictable, yet the case of Iran does not augur well for countries in similar circumstances.

C. The Case of Mexico

Mexico is much larger than Venezuela or Saudi Arabia, much more industrially sophisticated than Iran, and has advantages which none of the other petroleum syndrome countries enjoy. In literacy, urbanization, political integration, infrastructure and leadership, Mexico is far advanced compared with other petroleum countries when their booms began. Nevertheless, the gap between realities and the vision of what Mexicans want to become is enormous. By using petroleum to overcome conventional constraints and accelerate development, Mexico is straining its economy in ways not unlike its petroleum-rich predecessors.

After seven years of start-stop bouts with inflation and recession, Mexico returned to rapid growth in 1978. At first the economy displayed great elasticity, as expansion of GDP rose to 7.7 percent while inflation fell from 29 to 18 percent. By the third quarter, however, industry and consumers began to encounter several supply bottlenecks -- particularly in the areas of foodstuffs and transportation -- which began to drive prices upward. Expansion continued through 1979. Internal strains were partially relieved by a rise in imports made possible by growing oil revenues. Most sectors met or surpassed their planned goals in 1979, but the price index continued to outpace forecasts. Greater signs of stress came in 1980, when inflation reached 29.8 percent. At this stage, idle capacity had been exhausted, supply bottlenecks increased, and the economy continued to heat up.

Today policy-makers hope for a breakthrough, but

the current price spiral defies them. According to Mexican economist Samuel del Villar, "The government policy of combating inflation by increasing public expenditures and deficits, based on petroleum financing, under the theory that this path would break the bottlenecks which keep supply from satisfying demand, has not worked."*

For the time being, the country has clearly reached the outer limits of its capacity to expand. The rate of growth for the industrial sector declined from 10 to 7.3 percent during the first half of 1980. Agricultural production improved substantially in 1980 after several years of drought, but demand increased much more rapidly. Raw materials and food had to be imported. Imports rose by 47 percent in 1979 and by 55 percent during 1980. The clogging of the nation's rail and port facilities are the most visible testimony of the over burden on the economy. But shortfalls in steel, electrical, and cement output also have an important general impact.

D. Telltale Symptoms

Mexico's attempt to grow by 8 percent or more yearly is causing major problems. There is the danger that, rather than evening out its growth, Mexico will use petroleum to keep pushing forward regardless of the cost, exaggerating the manifestations of the petroleum syndrome. To date, Government leaders are adamantly committed to a 1.5 million barrel per day export ceiling, together with a 2.75 million barrel per day ceiling on crude production. Yet the Energy Program released by the Ministry of Patrimony and Industrial Promotion in late 1980 includes as one of its projections the possibility that total petroleum output reach 8-9 million barrels per day by 1990. To be sure, this is labeled the "pessimistic scenario," because it is viewed as, and is indeed, contradictory to the long-term interests of the country. However, certain symptoms have begun to appear in the Mexican economy which might bring the "pessimistic scenario" into reality. A report released by presidential advisor, Jaime Corredor in late 1980 drew attention to these symptoms, without suggesting how to reduce or alleviate them. These symptoms include:

* Razones, No. 24, Mexico, D.F., December 1-14, 1980,
p. 7.

- Overvaluation of the peso. Despite rates of inflation well above those of most of its trading partners, Mexico is able to maintain a stable exchange rate by means of rapid increase in petroleum exports and large capital inflows. This is a feature common to many petroleum syndrome economies. Local industry cannot compete on an international basis and requires protective walls which encourage inefficiency and oligopoly. Mexico claims to have its currency on a "float," but the shift in peso value against the dollar has been scarcely 3 percent over the past four years. Some experts estimate that the peso is currently 25 percent above its purchasing parity level with the dollar. Currency overvaluation robs Mexican exports and tourism of much of their competitiveness.

- Stagnation of non-petroleum exports. Manufactured exports crept forward by only 5.9 percent in current dollar terms in the first nine months of 1980. This was due to a rapid increase in domestic demand, partially fed by monetization of the oil income, and shortages of raw materials. Export goals spelled out by the NIDP and the Global Plan will not be fulfilled during the next few years. The following figures, released by Commerce Secretary Jorge de la Vega Dominguez, illustrate the trend:

Increase in Manufactured Exports
Compared to Previous Reporting Period

	<u>1978</u>	<u>1979</u>	<u>Jan-Sept 1980</u>
Increase in manufactured exports (nominal)	38.9%	8.2%	(5.9%)
Manufactured goods as a percentage of total exports	36.6%	26.9%	17.3%

While growing oil exports explain the drop in manufacture's share of total exports, inflation and the booming domestic market explain the absolute decline in export growth. Moreover ninety-five percent of Mexico's businesses are not structured for export, according to a government official. In fact, a knowledgeable trade association economist estimated that among Mexico's 800,000 businesses, no more than 150 were seriously interested in exporting and capable of doing so. Small businesses are particularly vulnerable to defects in fiscal and incentive policy, and have great difficulty in mastering the marketing and distribution system necessary for export. Five private associations and one government bureau (IMCE) are devoted to exporting and all report the short-term prospect for exports is modest.

- Excessive fiscal dependence on petroleum. Whereas the Global Plan projects that taxes on petroleum production and exports will constitute 22 percent of federal revenues by 1982, for 1981 they are already expected to contribute 26 percent. The government is beginning to shift new fiscal burdens to the petroleum sector as a means of escaping the political pressures brought by inflation. One by one, export items are being granted exemptions on value-added and export taxes in order to preserve their competitiveness. Another example is the decision to exclude all food items from the value-added tax for 1981.

- Inefficient energy consumption. During 1980 the consumption of regular gasoline increased by 30 percent, that of premium unleaded by 44 percent, and that of diesel by 13 percent. These rises are far above their historic proportions and indicate an increase in inefficiency encouraged by the government's price control and subsidy policies. The government took measures to correct these distortions at the end of 1980. Prices on several commodity items and premium gasoline were increased. However, regular gasoline remained well below world price levels.

- Treatment of the wage-price spiral. If inflation repeats or surpasses the 1980 level of 29.8 percent in 1981 and 1982, labor will step up its wage demands. Since many firms will not be able to comply without passing on additional labor costs in the form of higher prices, the government will have to arrange for settlements which offer subsidies on credit and consumption. This formula presents nothing new in itself, but the fiscal burden imposed by increased subsidies will represent a further shift of oil revenues from capital to current consumption expenditures, prejudicing the growth of real output. Otherwise, if the subsidies are financed through deficits, their impact could be highly inflationary at a time when the economy is already overheated.

E. Political Factors

None of the above symptoms is beyond correction by means of measures which accept short-term costs for medium- and long-term balance, but political factors handicap the ability of the Mexican Government to take major initiatives during 1981 or 1982. President Lopez Portillo must reveal his successor by July of this year. The successor will then be nominated by the official PRI party in September. From that point on,

the power of Lopez Portillo's administration will tend to diminish. Normally, a Mexican president must pass the first two years of his term in office consolidating his powers and building a loyal and coherent administration. Most major policy decisions are made during the second two years. Historically, the final two years stress maintaining a stable course in order to assure a tranquil presidential succession. An outgoing president tries to avoid decisions that require commitments that cannot be fulfilled during his remaining time in office. He also tends to shun anything that might cause economic downturns or disputes that might cloud his historical legacy.

Of course, indecision or deadlock may cause problems to accumulate, resulting in last minute crises. This was the fate of the 1970-1976 presidential administration. The government of Luis Echeverria tried to override stagnation and social division by means of big public sector spending at a time when the economy could not sustain it. The populist gamble collapsed in the atmosphere of crisis surrounding the 1976 devaluation.

Economic conditions in Mexico are different today than what they were in 1976, but Lopez Portillo is aware of the problems surrounding his own political power and the presidential succession. It will not be easy to avoid the temptation to seek a smooth finish to his term by means of expansion of petroleum-based loans, subsidies, and imports. The formula might work through 1982, but the burden of fighting the resultant petroleum syndrome distortions would fall squarely on his successor. The successor would either have to announce increases in the oil export ceiling -- thereby opening a new and deeper round of the petroleum syndrome -- or bring a painful economic slowdown in order for the inflation-worn economy to cool.

F. How to View the Discussion of Constraints

There are two lights in which we must see the following discussion of constraints. First, there are the long-term problems which the current surge in growth has caused to emerge as bottlenecks. These include the issues of transportation, skilled labor, and the problems of regionalism and federal-local relations. Second, there are the problems which petroleum wealth promises to modify. Energy, financial, and external constraints no longer bear on Mexico the way they did before the advent of oil. However, they

remain on the scene under a new guise without ceasing to present serious issues and limiting factors for policy-makers. Our examination will assess the extent of these constraints and the prospects for their resolution.

II. FINANCIAL AND EXTERNAL CONSTRAINTS

Mexico's petroleum resources place it in an enviable position in comparison with most developing countries. However, despite oil, credit remains scarce for several key investment areas. At the same time, inflationary pressures prohibit feeding excess demand or denying access to foreign goods. Raw material and other goods shortages required a rapid increase in imports during 1979 and 1980. Mexico's credit rating is healthy enough to handle the surge in imports for the time being, but the economy can not bear continual 50 percent increases in imports without becoming a mono-exporter of petroleum. That is a status which Mexico's leaders are anxious to avoid.

A. A Review of Recent Trends

Table I shows some key indicators of recent Mexican economic performance in constant peso terms. GDP growth slowed after 1974 and suffered per capita declines in 1976 and 1977. Growth was restored in 1978 and has continued since then. Inflation increased from 15.9 to 29.0 percent in the wake of the devaluation of 1976, which saw the peso fall from \$0.08 to \$0.044. Temporary austerity measures, combined with a renewal of investor confidence, set the conditions for a return to growth and a decline in inflation. In 1979, however, consumer prices came under renewed pressures and by 1980 inflation had risen to 29.8 percent.

The government has relied on public expenditures as the principal impulse to growth since the beginning of the 1970's when market instabilities set in. Inflation, combined with negative interest rates, have been a disincentive to savings, and bank deposits declined from 23 to 15 percent of GDP between 1970 and 1976. Deficit financing has been used in view of the inability of the government to improve revenue collection and the slow growth of private sector investments. By 1976 the federal deficit grew to 5.4 percent of GDP. Following the 1976 recession and devaluation, the government put on the brake, implementing a real decline in federal expenditures for 1977. The federal deficit fell to 3.8 percent of GDP. The decline of tax receipts, plus a fear of deepening the recession, prohibited closing the deficit any further.

After 1977 the pattern of public sector spending-led growth was restored. Gross fixed capital formation rose from 20 to 24 percent of GDP. Currency stability encouraged bank deposits to grow from 15 to 17.6 percent of GDP between 1976 and 1979, despite continued negative interest rates. Monetary expansion (M1) grew from 26.1 to 33.1 percent between the year of austerity, 1977, and 1979. Authorities reduced the rate of monetary expansion to an annual rate of 28.4 percent during the first seven months of 1980. This helped cool the contribution of demand to inflation. However, complaints about credit tightness from the private sector caused the government to allow monetary expansion to increase once again; 1980 ended with 32.2 percent growth in M1. Supply-side bottlenecks in raw materials, foodstuffs, and transportation further aggravated price increases.

The public sector absorbs slightly over half of all bank credit annually. That leftover -- representing nearly 13 percent of GDP in 1980 -- is a hefty sum by developing country standards, but private investors have complained that in some cases credit is insufficient for them to achieve their sectoral goals as stated in the National Industrial Development Plan. This was not so apparent in 1979, when most sectors met or surpassed their expansion goals largely through the use of existing idle capacity, but by 1980 capacity utilization in industry at large soared past 85 percent. Some industries, such as copper wire, saw operations surpass 100 percent of installed capacity. At this stage the credit crunch sharpened as investors competed for funds to hasten the completion of new plants and facilities. Rising costs for raw materials and transportation also increased the demand for short term credit. This credit shortage may jeopardize the ability of the private sector to meet its sectoral goals for 1981 and 1982. It particularly impinges on small businesses which create the most employment, not only absolutely but also in terms of jobs per unit of capital investment.

Mexico's private equity and securities market is small, unstable, and contributes a comparatively small portion of the capital needed by firms. Industrial expansion depends largely on government policies as exercised through the banking system and the trust funds under Nacional Financiera. With domestic savings limited, the government has allowed foreign indebtedness to grow to keep the rate of capital formation high. Shortages of strategic goods and materials have also required relief by means of external sources. The economy has opened substantially since 1978; yet, de-

TABLE I: Mexican Domestic Financial Figures

	Billions of Pesos			
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
<u>Gross Domestic Product</u>				
1. Total (1975 pesos, billions)	1,009.3	1,042.2	1,115.7	1,202.8
Percent increase	2.1	3.3	7.0	7.8
2. Per Capita (1975 pesos)	16,193.0	16,136.0	16,667.0	17,336.0
Percent increase	-3.6	-0.3	3.3	4.0
<u>Money Supply</u>				
Currency and Demand Deposits (current pesos)	154.8	195.7	260.3	346.5
Percent Increase	30.9	26.4	33.0	33.1
<u>Bank Deposits</u>				
Total (1975 pesos)	152.4	175.1	184.2	212.3
Percent Increase	-	15.0	9.1	15.3
As a Percent of GDP	15.1	16.8	16.5	17.6
<u>Consumer Prices</u>				
Index (1975 = 100)	115.9	149.5	175.5	207.5
Percent Increase	15.9	29.0	17.3	18.2
<u>Gross Fixed Capital Formation</u>				
Total (1975 pesos)	219.9	211.1	250.2	290.9
Percent Increase	-0.8	-4.0	18.5	16.3
As a Percent of GDP	21.8	20.3	22.4	24.2
<u>Government</u>				
1. Expenditures				
Total (1975 pesos)	172.2	170.0	181.4	209.5
Percent Increase	17.2	-1.2	6.7	15.5
As a Percent of GDP	17.1	16.3	16.3	17.4
2. Deficit				
Total (1975 pesos)	54.3	39.9	34.1	43.9
Percent Increase	25.1	-26.5	-14.5	28.7
As a Percent of GDP	5.4	3.8	3.1	3.7

SOURCES: Banco de Mexico, Indicadores Economicos, August, 1980; IMF, International Financial Statistics. January 1981.

spite the cushion which oil provides for continued trade deficits and borrowing, constraints remain. These will be examined below.

B. External Sector

Mexico's balance of payments situation has improved greatly with the advent of oil. Between 1978 and 1980, the portion of export earnings absorbed by interest payments on the foreign debt fell from 30 to 24 percent. Without oil sales, this ratio would have risen from 41 percent to an uncomfortably high 73 percent during the same period. In 1980, crude oil and gas exports earned 40 percent of Mexico's current account receipts and 65 percent of its export receipts. Without this margin of exchange earnings, Mexico's present rate of growth could not have been maintained and the economy would be in serious trouble.

Mexican leaders are aware of this growing dependence and want to mitigate it as much as possible by promoting non-petroleum exports. Domestic demand, shortages, and inflation, plus recession abroad, have frustrated this goal so far. As supply and service bottlenecks grew in severity during 1980, the expansion of industrial output fell from a rate of 10 to 7.3 percent. A large portion of this new output had to be devoted to satisfying local consumers before markets abroad could be considered. As a result, manufactured exports stagnated, climbing only 5.9 percent in current dollars during the first three quarters. There is little evidence that this situation will change during 1981 or 1982.

Mexico continues to experience trade and current account deficits. Despite early hopes that 1980 would finish with a mild trade surplus, by the end of the year the deficit stood at 1,709.5 million compared to \$2,213.6 million in 1979. The current account deficit increased from \$4,856.4 million in 1979 to \$6,596.6 million in 1980. This was due largely to substantial increases in public sector interest payments, border purchases by Mexicans visiting the United States, and a 55 percent increase in merchandise imports. However, despite the large increase in grain imports during 1980, the share of imports represented by capital goods fell only slightly, from 29.2 to 26.6 percent. The foreign agricultural balance during the first three quarters registered a noteworthy, though by no means catastrophic, \$107 million deficit. This sectoral balance rapidly changed with the importation of \$1.5 billion worth of grain during the fourth quarter.

TABLE II: International Statistics, Mexico

	Millions of U.S. dollars		
	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>Current Account Balance</u>	-2,693.0	-4,865.0	-6,596.6
<u>Trade Balance</u>	-1,646.0	-2,841.0	-3,264.7
Exports	6,764.3	9,923.8	15,307.5
crude oil and gas	1,773.0	3,765.0	9,878.4
as a percent of total	26.2	37.9	64.5
Imports	8,410.5	12,764.8	18,572.2
capital goods	1,981.0	3,577.0	4,940.3
as a percent of total	23.6	28.0	26.6
<u>Foreign Reserves</u>	2,246.	2,988.	4,003.
Reserves / Monthly Imports	3.2	2.8	2.6
<u>Foreign Indebtedness</u>			
Public	26,883.	29,980.	33,800.
as a percent of GDP	29.	25.	26.
Private	9,407.	10,444.	11,900.
as a percent of GDP	10.	9.	9.
<u>Public Foreign Debt Services</u>			
Interest Payments	2,023.	2,888.	3,958.
as a percent of exports	30.	29.	26.
as a percent of non oil and gas exports	41.	47.	73.
Amortization	4,264.	7,268.	3,273.

High world interest rates are one reason for the growing service account deficit. Mexican inflation is another reason. It reduces the competitiveness of its tourism industry abroad and at the same time encourages Mexicans to travel north and spend their money in the United States. Tourism receipts increased by only 16.7 percent during the first three quarters of 1980, while expenditures grew a vigorous 40.5 percent. Mexico's \$481 million tourism surplus during the first two quarters was followed by a \$12.1 million deficit in the third quarter. With both recession in the United States and continued inflation at home, the Mexican tourism industry may continue to face deficits through 1981. The growth of border expenditures also outpaces that of border receipts, leading to the prospect of upcoming deficits for that service account item as well.

Strong investment prospects have enabled Mexico to draw large sums of long-term capital and thus keep the external capital account in substantial surplus. However, the rise in U.S. interest rates to over 19 percent during the first third of 1980 caused a serious "dollarization" problem in Mexico's banking system. Local interest rates ceased to be competitive and many Mexicans shifted their assets to dollars. When U.S. interest rates fell during the middle of the year, patterns returned to normal. The subsequent return to restrictive monetary policies and high interest rates by the end of 1980 caused dollarization to reappear as a threat to Mexican savings. In response, the Mexican government raised prime interest rates to 25 percent. This rate, although still below inflation, poses difficulties for small customers who must pass on the additional cost in terms of higher prices, fueling inflation in the process.

Foreign reserve holdings by the Bank of Mexico increased from \$2,246 million to 4,003 million between 1978 and 1980. During the same span, however, the number of months of imports covered by central reserve holdings -- a common measure of foreign trade security -- actually fell from 3.2 to 2.6. This is considered a small margin by most standards. The growth of Mexico's imports has been so rapid as to preclude the possibility of greater reserve accumulations, and this is in spite of a 162 percent increase in oil and gas exports during 1980.

C. Increase in Imports

Mexico's public foreign indebtedness rose from \$26.9 billion to \$33.8 billion between 1978 and 1980.

As mentioned above, oil exports have reduced the burden of debt service in spite of this debt increase and in spite of much higher interest rates. However, if imports continue to grow at their present rate (between 45 and 55 percent) Mexico is unlikely to become a net capital exporter very shortly. Should Mexican crude exports expand to 548 million barrels in 1981 (1.5 million barrel per day average), earnings at \$35 per barrel will be \$19 billion. If non-oil exports continue to increase by a sluggish 5 percent, total exports will be \$26.6 billion. Total imports, should they increase by only 45 percent compared to 56 percent in 1980, will be \$26 billion. Thus Mexico may experience a mild surplus. Yet, barring an unusually high oil price increase or a decision to abandon oil export ceilings, the trade balance can be expected to return to deficit by 1982.

Of course, Mexican leaders do not plan for imports to increase so rapidly. Neither do they wish to become so oil dependent. Reducing import growth and boosting non-oil foreign exchange earnings will depend on several factors: relieving transportation bottlenecks, bringing new production capacity to full operation, and controlling inflation. None of these challenges is an easy matter, and none will likely meet with complete success. Decision-makers in Mexico appear to base hopes of conquering inflation on solving the first two problems -- that is to say, a "supply side approach," albeit with instruments different from those proposed by American fiscal conservatives. The Mexican solution involves continued doses of increasing public sector investments.

The exchange rate of the peso will continue to pose a dilemma as long as the difference between Mexican and U.S. inflation continues to be wide. Mexican leaders are aware of the fact, but are eager to seek solutions short of exchange rate adjustment. The "maxi-devaluation" of 1976 caused a panic and capital flight which officials are anxious to avoid repeating. On the other hand, gradual adjustments do not yield much promise either. The experiences of Brazil and Peru suggest that mini-devaluations also spur inflation and make it a permanent feature of the economy. Due to the border shared with the United States, Mexico faces an additional difficulty in implementing the exchange controls necessary to administer periodic exchange rate adjustments efficiently.*

* See: Ortiz, G. and Solis, L., "Tipos de Cambio Flotantes y Deliz Cambiario: Las Experiencias de Algunos Paises en Desarrollo," Document No. 17, Subdireccion de Investigaciones Economicas y Bancarias, Banco de Mexico, D.F., January, 1980.

D. Anti-Inflation Measures

The Mexican government enacted a 10 percent value-added tax in 1980 to improve the federal revenue system and to reduce the regressive features of the older 10 percent sales tax. Previously, a "cascading effect" caused prices and inflation to be highest in poor neighborhood retail outlets. The new tax features additional qualities which allow the government to increase total revenues more efficiently. During the first eight months of 1980, the expansion of annual federal revenues increased from 36.0 to 65.4 percent. To ease the impact of inflation on low income groups, a list of basic consumption items was exempted to all food items in 1981. Implementation of the value-added tax has not been without problems. The new tax contributed to inflation at the outset of 1980 and misunderstandings over how to apply it, and speculation aggravated this effect. Estimates are that the tax contributed 3.5 percentage points to the 28.5 percent year-end total for price increases. In spite of the new tax, the public sector deficit increased from 6.6 to 7.4 percent of GDP between 1979 and 1980.

Basic commodities are subject to price controls. Periodic adjustments are made so that an item is always priced according to a certain multiple of the minimum legal wage. Basic food prices are also kept down by means of a complex set of subsidies. Corn subsidies alone totalled \$360 million in 1980. Although this is a large sum for a developing country like Mexico, the transfers portion of federal expenditures actually declined from 29.7 to 27.2 percent between 1965 and 1979. While transfers and exemptions do not solve inflation, the Mexican government depends on them to keep labor peace and to reduce the general social frictions brought on by inflation.

Mexico's anti-inflation strategy combines public investments, fiscal reform, price controls, and recourse to imports of scarce goods and materials. Whether this approach will meet with success remains to be seen. The passage of time raises doubts. As of October, 1980, however, the Mexican Foreign Trade Institute (IMCE) reported that "[w]ith less than three months before the year is done, it appears that the most pessimistic predictions with respect to inflation will be fulfilled." **

** Comercio Exterior, Vol. 30, No. 10, Mexico, D.F., October, 1980, p. 1067.

E. Summary

During the 1980s Mexico will continue to face trade and current account deficits, barring a lofty hike in the petroleum export ceiling. A surge in manufactured exports may come late in the decade, but not before. Until then Mexico will be busy combating domestic shortages and inflation. Grain imports will stabilize for the next three to four years as the SAM basic foods policy yields its results. Mexico's oil reserves and overall growth prospects guarantee a privileged international borrowing position. Mexican leaders will likely decide to accelerate mini-devaluation of the peso in order to stabilize trade. However, imports will grow rapidly until domestic bottlenecks are relieved.

Oil has not eliminated financial or external constraints to Mexico's growth. If Mexico wishes to follow a balanced course and avoid the "petroleum syndrome," it may have to make revisions in the sectoral goals set by its development plans to reflect shortages, high interest rates, and credit scarcity may require. At times this may mean accepting lower rates of aggregate expansion in order to deal with the "financial indigestion" about which President Lopez Portillo has warned. During 1981 inflation control, "putting the bell on the cat's tail," as IMCE has put it, in considered the primary challenge. If the attack on inflationary bottlenecks represented by raw materials, foodstuffs, and transport inadequacies yields success, Mexico will be able to continue a course of rapid growth. If not, then monetary restraint, demand control, and slower growth may characterize the first half of the 1980s.

III. TRANSPORTATION CONSTRAINTS

A. Overview

Transportation is the greatest single bottleneck affecting trade and industrial development in Mexico. Inadequate railroads are at the heart of the problem and because of this all other types of transportation suffer from overload. The most severe impacts of Mexico's inadequate rail network are felt at points of entry -- the border crossings and ports. At any one time during the last two years thousands of cars have been backed up at the border crossings, sometimes for a thousand miles. By the end of 1980, the situation had become so severe that the Mexican National Railway had closed the border to additional foreign cars.

Mexico's railroad system is virtually the same one that was completed in 1910 and partially rebuilt during the 1930s. The system consists of about 20,000 kilometers of single track with "passing lanes" and sidings. Since the last overhaul there has been a one thousand (1000) percent increase in the cargo volume carried by the system (7.1 million tons in 1930, 56.2 million in 1978). The result is that the internal system is clogged and overloaded, forcing at least one company to conclude that it was faster to import steel from Sweden through Brownsville, Texas, than to try to bring it to Monterrey from Colima, Mexico, just a few hundred miles away.

Today, Mexico is not prepared to import or export in large volume through its few existing port facilities. Commodities intended for export can sit on loading docks for months while ships are readily available.

The failure of the rail system and the lack of port capacity is taking its toll on Mexico's road system. Mexico's truck fleet, one of the largest per capita in the world, shoulders a higher percentage of heavy equipment movement than most countries, increasing beyond normal the need for repairs.

B. Railroad

A recent study of the nation's railway system prepared by Confederacion Patronal de La Republica

Mexicana (COPARMEX) cited the following problems:

***Rolling stock -- Inadequate maintenance programs and indifference to investment in maintenance results in rapid deterioration of existing equipment. Consequently, some areas realize little net gain in equipment despite increasing expenditures and commitments for still greater investments in rolling stock.

***Roadbed and tracks -- Most of the nation's 20,000 kilometer system was built before 1910. Even the "core" 5,000 kilometer system that carries about 80 percent of the traffic is approaching 50 years of age. Much of this track suffers from half century (or even full century) old engineering concepts that naturally were keyed to contemporary steam locomotives rather than modern diesel electric equipment, as well as turn-of-the century materials and construction techniques. Extensive switchback and curve systems often require extra locomotives which must be stationed at strategic points and add extra miles and hours to move freight.

In addition, virtually the entire system, including the core portion, remains single track with sidings for passing. This forces extensive and time consuming scheduling maneuvers in order to accommodate increasing traffic. However, as traffic increases, sidings are increasingly inadequate to handle needs.

Finally, there seems to be an growing use of sidings, freight and switching yards to simply store cars waiting for loading or unloading. This use of track facilities for dead storage is further complicating traffic management on the railroads. Ironically, much of this congestion can be traced to Mexico's increased appetite for United States agricultural products, particularly grains and oil seeds, important trade items between the two nations. Mexico's national corporation for importing cereal grains, CONASUPO, often is guilty of using valuable track space while inspecting enormous grain shipments one car at a time.

***Labor -- There are indications that the Mexican railroads, like many United States railroads, are overstaffed and bureaucratically inefficient. Part of this problem is attributable, according to some observers, to the inadequacy of the railroad retirement program as well as the power of the railroad unions. Older workers are reluctant to give up their jobs without assurance of fully-funded pensions and health care systems (see below).

The Government of Mexico has recognized the reality of these problems and proposes a series of programs to help resolve them.

1. Government Spending Plans

The response of an oil-rich government to this problem is to spare no expense. In October, the national railroad company announced a capital investment program of \$1,599,000,000 for 1980-82 to purchase locomotives, bridges and trestles to handle more and heavier trains.

In September, 1980, the national railroad, in association with General Electric, began the manufacture of one thousand locomotives at a new plant in Aquascalientes. By the end of 1981, the first 33 locomotives will be produced at the plant. In the meantime, Mexico will purchase 78 diesel locomotives, all from the United States.

To provide rolling stock, the Mexican national railroad construction company plans to acquire 78,000 cars in the next 20 years, most of them to be constructed in Mexico. No projections are yet available for the level and composition of local construction, but the following comparison illustrates recent trends:

<u>Type of Car</u>	<u>Year</u>	
	<u>1975</u>	<u>1980</u>
Boxcars	705	1141
Ore Gondolas	1548	466
Other Gondolas	200	1351
Cabooses	-	45
Passenger	100	15
Special Platform	-	1
Other	-	7
TOTAL	2553	3026

Local production has increased, but the present government has made no major effort to increase railcar construction capacity substantially. About 35 percent of the 25,000 cars Mexico plans to acquire between

1980 and 1985 will have to be imported. During 1981, Mexico will purchase 1500 boxcars, 1000 flatcars and 120 tank cars, nearly all from the United States. In 1980, the government invested \$390 million in the railroads. Most of these funds were directed towards railbed improvement and modernization.

With assistance and technology from France, Mexico plans to electrify large portions of its railroad system, beginning in 1982 with a section from Mexico City to Queretaro. What Mexico calls its Basic Network -- 5000 kilometers of track which handle 80 percent of the traffic -- is to be maximized with an extensive improvement system.

In November, Mexico announced plans to complete a long-dreamed-of "land canal," a rail link between the Caribbean port of Coatzacoalcos through the mountains to the Pacific port of Salina Cruz. Forty million dollars will be spent for improvement of the roadbeds for eight locomotives and for 26 flatcars, all built by General Electric in the United States. Two more locomotives and 114 flatcars will be delivered by April, 1981. The system will initially consist of 20-unit trains of piggy-back containers going each way each day. The system is expected to compete favorably with shipments through the Panama Canal and to pay for itself in 15 years.

2. Institutional and Human Problems within the Railroads

If the railroad problem could be solved by money alone, the Mexican railroad system would be efficient by 1982, as called for in the plan. Very few persons who depend on the railroad system in Mexico believe this will happen and most observers expect the rails to get worse before they get better, hopefully sometime around the middle of the decade.

Mexico's rail problems are similar to that of modernizing the railroad system of other countries, developed and developing alike. Over the years, rules, regulations and institutional rigidities have encumbered the system. In the United States the inefficiencies, lack of incentives, and questionable economic viability of the railroad system have caused public take-overs, mergers, and finally, in 1981, substantial deregulation. While not entirely similar, fundamental changes will also have to be made in the Mexican railroad system. The public character of the railroads and absolute necessity for substantive change could enable Mexico to make these changes quickly.

Unlike the workers of PEMEX, Mexico's largest public enterprise, the railroad workers are not well paid or well trained. The railroads are over staffed. The government estimates that the railroad employs 25,000 more workers than it needs, but the government is frustrated in attempts to offer a generous early retirement incentive because the railroad pension fund lacks sufficient accumulated capital.

3. Unique Rail Problems at the Border

Compared to Canada, where commerce flows smoothly at the border, delays at the nine United States/Mexico border crossings are substantial and could eventually discourage trade in both directions. Some of the problems can be traced to lack of railyard capacity on the United States border. However, a large portion of the problem is at the border itself, and specifically in the documentation required for export and import.

Whereas shipments between United States and Canada involve only four documents, shippers from the United States to Mexico must fill out at least eleven separate forms. A minimum of nine individuals in nine companies or agencies must handle the documents, mostly by hand, because little use is made of the computer.

A number of improvements involve a relaxation of the significance of the physical border as termination or commencement of each country's sovereignty. Unit trains from the United States could cross the border with the same crew, as do planes, ships and buses. Mexican agricultural inspectors could inspect, certify and seal cargos at terminals away from the border -- say in Albuquerque for crossing in El Paso. Invoices could be transmitted to the border electronically instead of hand carried by brokers.

Official shippers and railroad leaders on both sides of the border are working to overcome these problems. In November, agreement was reached to speed the handling of documents at the border by instituting a schedule of around-the-clock processing. To indicate how critical is the human element, for the first two weeks the system did not work at all because additional Mexican customs agents did not report for work.

The embargo cut short pressures to improve the speed of documentation but the embargo itself did not result in any immediate improvement. At the end of the first month only a few thousand of the cars which were clogging the Mexican system had been returned to the United States. After three weeks the average daily

return of 170 United States rail cars had not changed, with about 33,000 cars remaining in Mexico. Not all of these cars were sitting empty on sidings. Purchased goods and equipment are often allowed to remain in railcars, either because of a lack of storage or immediate use for the goods or because shippers know the car will not be readily returned when emptied.

One significant initiative to bring relief to border rail problems is underway in the Brownsville vicinity. Twenty-five million dollars are being invested in rail relocation in order to route major rail arteries outside of congested urban areas. When this project is completed in three years, traffic flow will improve considerably. Brownsville port area authorities also hope to cooperate with newly-elected Mexican officials after 1982 to establish a special joint rail terminal to handle freight loads, which are expected to continue doubling every five years. It is estimated that the combined relocation and terminal development will save local industry \$100 million annually.

Railroad documentation problems at the border can be seen simply as one inevitable consequence of expanded commerce hitting archaic institutions and ways of doing business. But the failure to break the log jam says as much about the importance of sovereignty and prerogative as about the unwillingness to modernize. Trucks regularly crawl through the desert at night bringing black-market television sets, refrigerators and other bargains from the United States to Mexico's middle and upper class. Mexico's poor penetrate the border with relative impunity and border towns regularly exchange cooperative advantages -- PEMEX's fifty cent gas on one side and United States toys and toasters on the other. But machines, components and food stuffs, coming to Mexico by rail from the United States, catch the full meaning of the border and the limits of sovereignty. Slowly, modern technology and an atmosphere of trust may soften the significance of the physical border so that the human element and new investments will relieve the transportation bottleneck in the next Presidency.

C. Road Transportation

The amount of freight hauled by truck increased rapidly in Mexico during the 1970s. Between 1970 and 1979, registered ton-kilometers rose from 43 thousand to 85 thousand. Current forecasts are that this figure will reach 112 thousand ton-kilometers by 1982.

Despite government hopes to improve and increase railroad usage, truck transport will still account for a near record 70 percent of total land freight in that year.

Mexico has one of the world's largest per capita truck fleets with about 56,000 heavy over-the-road tractors and another 60,000 lighter short haul and intra-city trucks (common carriers, company-owned trucks not included). But the numbers are somewhat misleading because Mexico achieves only about 65 percent efficiency in the use of the fleet. Part of the problem is inherent in fleet management and part is attributable to factors outside the control of the industry.

One reason why full capacity is not used is that Mexico's trucking industry, rather than being a competitive field of medium-sized, well-organized firms, features a few giants and many tiny, proprietor run (and driven) participants. Of the 813 firms operating on Mexico's seven most important routes in 1975, 680 had a total capacity of less than 1000 tons and accounted for nearly 50 percent of the total capacity. On the other hand, a mere 29 firms (3.6 of the total) together accounted for 26.7 percent of the available capacity. It is difficult to coordinate the activities of firms with such different sizes and capacities.

There is a tendency to overestimate the capacity of Mexico's truck fleet to move cargo. This is due to a number of factors. First, there is a predilection in Mexico to purchase new equipment rather than maintain and renovate existing equipment. As a result, about 15 percent of the truck fleet carried on the books is not really available to haul cargo. Financial and tax structures may encourage this practice, as they sometimes do in the United States. The shortage of storage facilities also immobilizes a significant portion of the truck fleet. Often the vehicles themselves must be used for storage and stand idle for extended periods of time.

A third important problem is simply that the nation's elderly road system -- conceived mainly to move people and agricultural products -- is suffering from overuse both in terms of the number of vehicles being accommodated and the gross weight of the vehicles.

This situation is not unusual as can be seen from the fact that construction of the trans-Alaska Pipeline in 1975-77 left Alaska's highway system a shambles that is still not totally repaired.

At the end of 1980 only about 65,900 kilometers of highway out of a national network of more than 200,000 kilometers was completely paved. The balance of the system was oiled, graveled or graded earth. While the paved portions included the major cargo routes, it cannot be said that these roads are constructed, on the whole, to carry heavy multi-axle tractor-trailer combinations necessary for industrial cargos. The pressure on the road system means that resources that might be used for expansion and upgrading are used simply to maintain the current inadequate system of highways and narrow bridges, which, themselves, are an important source of frustration for highway users.

Finally, there is a tendency to use heavy, long equipment for door to door service. This means that trucks which might be carrying cargo are tied up in city traffic trying to load or unload.

The Highway Modernization Program of 1980-1990 projects \$4.2 billion in expenditures (at 1980 prices) during the present decade to improve and extend Mexico's road network. Of this amount, 25.3 percent will be spent between 1980 and 1982, 36 percent between 1983 and 1986, and 38.7 percent in the 1987 to 1990 period. In addition to maintaining the existing network, the investment program aims to increase four lane highways from 990 to 4000 kilometers and to increase the 12 to 13.5 meter wide two lane heavy route highways from 1750 to 10,000 kilometers.

Mexico's present system of trucking regulation dates from 1971. Four categories of traffic are established, each subject to different standards. Of the permits currently granted, 38 percent is for the regular freight category, 34 percent is for agriculture, 14 percent is for specialized freights, and 14 percent is for private use. Official tariffs are established, but it is common practice for operators to charge up to 50 percent above these rates. In 1979 and 1980 tariff increases of about 15 percent were authorized by the Mexican government as an incentive to the industry to expand and modernize its fleet. As in the United States, shipping companies have complained that this was "too little, too late" while shippers said the industry essentially forced the rate increase from the government at a time when the congested economy could not have absorbed a further reduction in the transportation network.

A debate over motor carrier rates in Mexico, centering around reduced rates for longer hauls, greater fleet efficiency and better management by both operators and regulators parallels the debate in the

United States over trucking deregulation.

Many of the same problems relating to border crossing, customs and inspection that plague the railroad industry apply equally to trucking. However, trucks do have the advantage that they can move more or less independently without taking up space while an entire train is readied. Equally, trucks do not (yet) need the precise traffic management that characterizes a railroad.

Trans-border truck shipments are subject to numerous customs and vehicle regulations which lengthen delivery time and contribute to production difficulties in Mexico. No cabs of U.S. origin are allowed on Mexican highways, and all freight must be transferred to Mexican trucks. All semi-trailers must be hitched to Mexican cabs at the border. U.S. trucking authorities have asked for an agreement to allow U.S. drivers and equipment inside Mexico. They point out that the Motor Carrier Act of 1980 facilitates U.S. entry for Mexican truckers who can cross the border and compete for U.S. business with ease. However, a corresponding agreement to allow U.S. truckers into Mexico is unlikely to be accepted by Mexican authorities who are reported to be "adamantly opposed."

D. Port Expansion

To overcome the lack of port facilities, Mexico is placing the highest priority on developing four ports, two on each coast. The ports, and the towns immediately around them, receive the maximum rate for every incentive available in the Mexican development system (Zone IA), encouraging their rapid development. Each port will have a complete, modern highway and rail system leading into the basic network. (For a discussion of how some ports are developing more quickly than others, see discussion of effectiveness of incentives in Section One.)

Veracruz and Tampico on the Gulf Coast are Mexico's two ports of greatest commercial importance. Facilities at Veracruz were neglected for years and have become seriously inadequate. A major investment and renovation program is now underway to adapt the port to modern roll-on and container shipping, but there will be a three- to five-year delay in seeing this program to completion. Facilities at Tampico are better, but their capacity is being dwarfed by an exponential increase in demand. Tampico is the port

benefiting most of its current Zone IA status under the National Industrial Development Plan. Rapid growth is expected.

Coatzacoalcos, further to the south, also enjoys Zone IA status. However, the shortage of local infrastructure, support industries, skilled manpower, and markets have made it difficult to attract investors. PEMEX is thus far the leading push factor in the development of Coatzacoalcos' port facilities. The greatest priority is assigned to expanding petrochemical storage and shipping facilities.

The serious difficulties faced by border rail traffic have caused an increase in the burdens on the Gulf coast ports. Delays and other problems can be expected to increase. As a result, exporters in the eastern and middle-western United States are in need of alternative routes. One promising possibility is a rail-ship-truck route using the port of Los Angeles and the Mexican Pacific coast port of Manzanillo. Manzanillo is reported to face little congestion at this time. Local trucking facilities can reach many interior cities with enough ease that the total delivery time between Los Angeles and the interior of Mexico is reduced to eight or nine days. In view of border rail embargoes and Gulf coast tie-ups, this route suggests a competitive alternative. West coast shippers in the United States are currently negotiating with the Federal Maritime Commission and Mexican authorities to expand services.

The U.S. port of Brownsville on the Gulf coast is also handling some of the freight unable to enter Mexico through Mexican ports further to the south. Goods entering the Texas port are transferred to truck and rail facilities for shipment to cities in northern Mexico. Maritime tonnage entering Brownsville increased by 45 percent in 1980, and rapid growth is expected to continue. To handle the additional traffic, Brownsville authorities seek financing for a major channel deepening project. Should funds be procured, the port will be able to handle the large bulk ore and coal carriers essential to serving the needs of Monterrey area industrial expansion.

IV. LABOR AS A CONSTRAINT ON GROWTH

Until oil became plentiful, Mexico's chief resource was its people -- millions of people willing to work at wages still three to thirteen times lower than those in its principal market, the United States. The cost of labor is rising today but remains an abundant resource for the foreseeable future. The constraints on Mexican growth, so far as labor is concerned, are two: first, the absences of sufficient skills in the right places; and second, potential labor unrest as the result of inflation.

A. A Huge Labor Pool, a Shortfall in Skills

It is frequently said that half of Mexico's population is unemployed or underemployed. While this statistic is roughly accurate, it misrepresents the nature of the problem to the American reader. In Baltimore, Maryland, thousands of people will line up at an employment office on the rumor that a few hundred CETA jobs are available. In Monterrey, Nuevo Leon, Mexico (which has no employment office) almost anyone who wants to work can do so and employers regularly "pirate" from one another, bidding up the value of skilled labor. Even facing a birth rate of 3.5 percent for the past two decades, Mexico is today producing slightly more jobs than there are new entrants in the job market: approximately three-quarters of a million jobs a year for the last two years, with a repeat of that performance expected in 1981.

The number of job market entrants will continue to climb for the next dozen years, tapering off after 1992-93, but for the intervening years Mexico will need to generate an average of nearly a million new jobs a year. This rate of growth will still leave almost the same absolute number of underemployed individuals in 1990, with some estimates indicating that the number of underemployed can be reduced from 44 to about 40 percent.

The labor pool in Mexico is huge. Today's population is almost 70 million. The number of individuals who are considered to be employable number about 20 million. The birth rate is now 2.9 percent and the government expects it to fall to 2.5 percent by 1982 as the result of a widespread and intensive birth control education program. If this program is success-

ful, Mexico's population in 20 years will be 104 million, nearly half that of the United States. Without it, 130 million people would live in Mexico by the year 2000. Mexico will clearly have all the labor necessary for any conceivable development plan.

Where this labor is located and what level of skill is available is another matter. Mexico has a shortage of skilled labor. It cannot train its workers fast enough, particularly in the urban areas of greatest need.

This is not an easy matter for the Mexican government to address. This is the first Administration that has been willing and able to publish statistics which reveal the extent of unemployment. It has done so consistently for three years in an attempt to galvanize support for its job-creation programs. But it is even more difficult to address the problem of shortage of skills because to do so is to address, as well, the migration problem.

While it is popularly supposed that Mexican immigrants into the United States are the rural poor, many of the migrants are skilled and semi-skilled persons who can earn as much as six times more in, for example, Houston as in Mexico City. One Mexican glass company estimates that 65 percent of the graduates of their 12 month training program head for the United States on the day after graduation. The building trades present a particularly difficult example of this problem for Mexico and the absence of skilled construction workers is a constraint on the public works projects.

In accordance with the National Industrial Development Plan a set of laws was enacted in 1980 which requires all firms with more than twenty employees to establish training programs, either on their own or in cooperation with other firms. Those failing to submit plans to the Labor Ministry for approval by March, 1981, will be subject to fines ranging up to 315 times the legal minimum wage. As of January, 1981, 48,921 cooperative plans involving firms employing 2.5 million workers, and 7,949 independent plans involving firms employing 1.2 million workers, had been presented. Many firms have yet to comply, and the Labor Ministry has sent out warnings.

Many question whether this regulatory approach will yield the desired results. Large, advanced firms must have suitable training programs anyway. On the other hand, it will be difficult to enforce compliance

among smaller firms. More must be done to facilitate the access of industries to modern personnel and training technologies. Manpower consulting services will be a major demand item in Mexico for years to come.

B. The Case of Monterrey

Monterrey is an industrial capital of Mexico -- part Pittsburgh, part Detroit -- located not far from the United States border. Its experience illustrates not only the problem of shortages but the elasticity of the labor force and the need to interpret employment statistics.

In the first eight months of 1980, 1,000 businesses were established or expanded in Monterrey. Unemployment dipped below four percent and, for all practical purposes, skilled manpower was unavailable to industry. The National Industrial Development Plan made it mandatory that employers offer training for their employees, but in the case of Monterrey the law is unnecessary since every company must train or forget about expansion. In fact, to stay even companies must increase salaries and expand benefits or face the prospect of other companies pirating away their best workers. Fringe benefits in Mexico can regularly run to 60 percent (the figure for Mexico's largest bank) and in Monterrey non-wage benefits are substantial. Where industry once observed an informal code of conduct which discouraged such practices, particularly at the executive and supervisory level, the code is in disarray today.

The number of persons employed in Monterrey has been rising steadily since 1973. Unemployment, however, has vacillated sharply. As more and more workers have moved into Monterrey, the number of unemployed that could be reported during a downturn has risen from 18,000 to 50,000.

Employment statistics in Monterrey exhibit an unusual phenomenon: when employment increases, unemployment increases. When employment drops, unemployment drops. When employment levels off, unemployment falls sharply. The explanation for this experience is probably twofold. First, people who migrate into the Mexican cities can reverse the process and go back to the country. Second, when no jobs are available, workers stop looking and depend upon others in their family to get them by. They get

the message quickly and do not return until the news improves. Housewives would fall into this latter category.

This illustrates some reasons why Mexico is able to survive with high rates of underemployment: the ability of families to survive by returning to the land or depending upon other wage earners. Temporary migration to the United States can be explained by the family sending one member out temporarily to bring back the income. Estimates of the amount of money brought into Mexico in this fashion begin at \$2 billion a year and run as high as \$5 billion.

The Monterrey example has also led economists in Monterrey to conclude that economic expansion can be curtailed by the absence of sufficient number of qualified personnel. Monterrey is facing this problem today. Lack of sufficient training is a major constraint in Mexico.

C. The Effect of Inflation on Mexican Labor

Real wages have dropped in Mexico every year since 1977, held down under the original "Alliance for Production" agreement between Labor and Lopez Portillo. The non-unionized middle class is also feeling the pinch between increasing taxes and higher prices. Those worst hit are the rural poor who have also suffered from drought and poor harvests. All of these conditions contributed to an undercurrent of unrest which has already led the government to institute its rural development program (SAM) and will, in 1981, lead to substantial wage increases. Most observers expect wage settlements in the neighborhood of 30 percent and the increase in the minimum wage accomplished late in 1980, average slightly above 30 percent.

Given these conditions, strikes have been remarkably rare the last two years. Strikes could become more prevalent in 1981 unless healthy wage and fringe benefit packages can be negotiated.

Wage settlements at or above the rate of inflation will initiate a now familiar ratcheting effect on inflation itself. The government of Mexico has attempted to avoid this solution by holding down the price of basic foods, regular gasoline, and bus and railroad fares. Lopez Portillo has pledged to raise the price of these subsidized commodities, although so

far he has succeeded only in raising the cost of some utilities and most recently, the price of corn. More inflation in the labor section is inevitable, making all but impossible the government's inflation goal of 22 percent for 1981.

The net effect of wage and commodity policies will probably be, in the next four years, as they have been in the past four: relative labor peace in the unionized segment of the labor force and in the rural areas of the country. While real wages may continue to erode, and frustrations develop when oil does not bring instant benefits, Mexico may be sufficiently disciplined, optimistic and patient to continue in the pattern of the past.

V. REGIONALISM AND INFRASTRUCTURE

Mexico's ability to achieve its development goals is heavily conditioned by the degree of internal geographic integration (regionalism) and by the quantity and distribution of basic resources and investments upon which other productive capacities depend (infrastructure). Here we will analyze both and point out what constraints they impose on Mexican expansion and stability.

A. Regionalism

Mexico can be divided into five regions: 1) the Federal District, 2) the Central Basin and West, 3) the North and Northwest, 4) the Gulf and Caribbean, and 5) the Southeast. Each economic region involves several states displaying comparable climate, resources, and levels of socio-economic development. Their fusion into a common entity called Mexico was a slow and difficult process and remains far from complete.

Mexico was until recently a predominantly rural nation with a weak central government. Local states and their governors enjoyed sizeable autonomy. On one occasion in the 19th century, the southern state of Chiapas broke away and joined the Federation of Central America. Yucatan, always proud of its regional characteristics, once set itself up as a separate republic and, on several occasions, was considered for entry into the United States. Only at the end of the 19th century did ruthless military force under Porfirio Diaz bring the regional fiefdoms under federal hegemony.

Today Mexico is an increasingly urban country with more than 38 percent of its population residing in cities of more than 20,000 people. Military expenditures, used as a crude measure of internal security and integration, are scarcely 0.7 percent of GDP. This compares to 1.2 and 1.9 percent of GDP in the cases of Brazil and Argentina, respectively. Spanish is the principal language of over 90 percent of the population. A national culture holds the country's nearly 70 million people together. However, many weak points remain. In 1970 nearly 40 percent of the population continued to live in dispersed, isolated villages of 500 inhabitants or less. Nearly 15 percent of the population belongs to Indian tribes. Some of these

continue to communicate mainly in their own dialects. Spanish may be spoken little or not at all. The gulf in the level of development of the different regions is great and continues to widen.

1. Federal District

The Federal District region encompasses Mexico City and the fringes of two neighboring states (Mexico and Puebla). It is the most urbanized and industrial region of Mexico. It currently contains more than 28 percent of the national population and generates over half of Mexico's GDP. The Federal District's factories, schools, stores, public facilities, and services act as a great magnet, drawing migrants from all parts of the country. Decentralization is a key goal of the present urban and industrial development plans, but the momentum of existing resources, market factors, and political pressures dictates continued growth and rising congestion for the area. The prospect of a metropolitan population of over 30 million by the year 2000 is indeed alarming, but few policies -- short of totalitarian intervention -- offer a ready means of braking the trend in that direction.

2. Central Basin and West

The Central Basin and West refers to the states of Queretaro, Hidalgo, Guanajuato, Jalisco, Michoacan, Colima, and Nayarit. This region may witness the greatest improvement in performance under the current development policies. Once the nation's chief mining and agricultural region, the Central Basin experienced a period of relative decline and stagnation during most of this century. Although its cities retained importance as commercial centers, it is only now that they promise to become major industrial foci. Their relatively favorable endowment of physical and human resources makes possible a good response to the fiscal and other incentives offered under the National Industrial Development Plan (NIDP). The West (Nayarit, Colima, and Michoacan) is in a less favorable position, but has the resources and a history of development achievements to suggest good future performance.

3. North and Northwest

The North and Northwest encompasses all those states between the Central Basin and the United States border, except for those on the Gulf of Mexico. Although heterogeneous, most display indices of development above the national average. Irrigation has converted belts of the region into important agricul-

tural zones. Most of the vegetables, cotton, and other crops which yield surpluses for export come from the northern and northwestern states of Sonora, Sinaloa, Durango, Coahuila, and Northern Baja California. Most agroindustrial investments by the State and private enterprise have traditionally benefited this region and will probably continue to do so in the future. Monterrey is the industrial giant of the North. Its firms, led by the Alfa and Visa conglomerates, continue to set the pace in private sector mining and manufacturing. However, the prospects for expansion of medium and small industries throughout the region are also good.

Agroindustry, related light consumer manufactures, and some heavier goods production will expand above the national average throughout the North. The Monterrey-Saltillo industrial zone will be the locus of the greatest expansion in capital and durable consumer goods output, but the industrial production of other centers will also gather maturity and momentum. San Luis Potosi, Zacatecas, Torreon, Gomez Palacio, and Hermosillo are all receiving a good response to the incentives offered by the NIDP. Despite serious transportation bottlenecks, they display the features necessary to overcome this and other barriers. In-bond industries in the border area have experienced success in recent years, but their expansion faces a serious exogenous constraint: economic prosperity and healthy demand in the United States. It is difficult to foresee continued growth in this activity -- both for political and economic reasons -- without United States recovery.

The generation of employment among the northern states could reduce somewhat the tide of job seekers who now seek seasonal and longer term remuneration in the United States. Even if Mexico maintains a rate of expansion above 6 percent, there will still be a lag of decades before the currently under-employed can be absorbed and it will be challenge enough to accommodate the more than 700 thousand new workers who enter the labor force annually. The medium-developed states of the North are currently the source of a great proportion of Mexican migrant workers. Fortunately, the region faces no extraordinary barriers to impede it from being relieved of that role in the long run.

4. Gulf and Caribbean

The Gulf and Caribbean region includes the states of Tamaulipas, Veracruz, Tabasco, and those of the

Yucatan Peninsula. Here are located the major ports of Tampico and Veracruz, as well as a number of cities of regional commercial importance. The ports themselves are in serious need of expansion and renovation. As such, they impose a constraint on growth. The region's agriculture, based on sugar, coffee, cacao, bananas, and pineapple, has been a traditional source of foreign exchange. Sugar itself, however, has been in stagnation for over 10 years, due to official price policies and mismanagement. With the growth in internal consumption, the government opted to use cheap sugar as a cushion against inflation, with the result that Mexico is now a net importer.

Veracruz, Tabasco, and the northern fringe of the state of Chiapas are the focus of Mexico's current oil boom. However, the impact is anything but entirely positive from a regional perspective. Tabasco and Chiapas currently produce more than 80 percent of Mexico's crude oil, yet the vast share of the fiscal and development benefits are destined to go to other regions. Currently government policy divides the oil revenues as follows: 89 percent to the federal government, 10 percent to the producing states, and 1 percent to the producing municipalities. There is no doubt whether the 11 percent which "stays at home" is or even can be invested intelligently in accordance with the development needs of the region. Corruption aside, there is a great problem arising from the demand for consumer goods fed by wages generated directly or indirectly by the oil business. Most of these must be imported from other regions, and local inflation reaches 70 percent.

Most of the skilled labor hired by PEMEX for drilling, refining, and petrochemical operations also comes from outside these states. Job opportunities for the local people are mainly limited to commercial, service, and informal positions of low productivity which are stimulated indirectly. With the rise in expectations kindled by the oil boom, regional cities have experienced a surge in rural-urban migration. Annual population growth rates of 10 to 15 percent are not uncommon. Rural displacement is also attributable to the expropriations and pollution due to PEMEX drilling and transport operations. The Mexican constitution was hastily amended in 1977 to allow PEMEX to acquire thousands of hectares, but disputes over rights and compensation are plentiful. The army was used in 1979 to remove peasants occupying drilling rigs in protest over land losses and on January 20, 1981, 12,000 peasants blocked the roads which access PEMEX's largest gas "sweetener" facility and a large

portion of its production area in protest over pollution damage to land and cattle, and expropriation in general. Complaints of "internal colonialism" are not rare when critics refer to the situation.

5. Southeast

The Southeast is Mexico's most impoverished region. The states of Chiapas, Oaxaca, Guerrero, and Morelos trail the nation at large in terms of growth, literacy, income, urbanization, health, and political development. In some zones of the region the population speaks mainly Indian dialects, and is barely integrated into the market economy. Tuxtla Gutierrez, Oaxaca City, Chilpancingo, and other regional cities have gained ground in industry and commerce, but the great bulk of the population remains involved in an archaic and undercapitalized brand of subsistence agriculture.

Guerilla activities in the Southeast were crushed in the early 1970's, but the Mexican army remains active with counterinsurgency and civic action exercises in the region. INI, COPLAMAR, and special organs of the Education Ministry have been created by the government to address the basic educational and social needs of the region's marginal population. However, these bodies remain severely underfunded. If economic development aimed towards satisfaction of basic needs is the goal of Mexico at large, the need is particularly acute in the Southeast.

Tehuantepec Isthmus crossing Oaxaca, in addition to the Pacific port of Salina Cruz, receive Zone IA and IB priority status under the NIDP. PEMEX investments in and around Salina Cruz have boosted the population and overwhelmed what was once a sleepy village. Balanced growth and stability are a long way off. Few firms are taking advantage of the NIDP incentives to locate there. Skilled labor is scarce, markets are remote, and most basic facilities are almost nonexistent. All four states have great potential for tourism. Many more jobs could be created in that sector; but, as the case of Acapulco in Guerrero suggests, the spillover effect for the rest of the state economy tends to be unimpressive. For the most part, the Southeast continues to await development policies that answer the region's needs.

6. Bank Credits as a Gauge

In Table I, bank credit is used as a means of gauging economic activity by region. As can be seen,

TABLE III

Total Credit Granted by Mexican Banks as of December, 1978.
Regional distribution (percent) of credit and population compared.

<u>(1) Region</u>	<u>(2) Credit</u>	<u>(3) Population</u>	<u>(2)/(3)</u>
Federal District	57	29	1.97
Mexico City			
State of Mexico			
Puebla			
Tlaxcala			
Central Basin and West	12	22	0.55
Queretaro			
Guanajuato			
Hidalgo			
Jalisco			
Michoacan			
Nayarit			
Colima			
Aguascalientes			
Gulf and Caribbean	7	15	0.47
Tamaulipas			
Veracruz			
Tabasco			
Quntana Roo			
Campeche			
Yucatan			
North and Northwest	21	23	0.91
Nuevo Leon, Chihuahua			
S.L. Potosi, Sonora			
Coahuila, Sinaloa			
Zacatecas			
Durango			
N. Baja California			
S. Baja California			
Southeast	3	11	0.27
Chiapas			
Oaxaca			
Guerrero			
Morelos			
	100	100	

Sources: Nacional Financiera, Banco de Mexico.

the Federal District region, while representing 29 percent of the nation's population gets 57 percent of the credit. This gives it a credit-to-population ratio of 1.97. Second comes the North and Northwest with a ratio of 0.91, third the Central Basin and West with 0.55, fourth the Gulf and Caribbean region with 0.47, and the Southeast falls a distant last with 0.27. Such financial data suggests greater regional differences than would emerge from figures on regional production of goods and services. However, it is useful in indicating that the financial resources that aid current and future development are very unevenly distributed. Regional differences will continue to increase.

7. The Politics of Regionalism

Politically, Mexico is a federation divided into states and municipalities. In the contemporary period, the federal government has risen to enjoy complete supremacy. Most legal, fiscal, and personnel power resides in the capital, and the executive has ample superiority over the legislature and the judiciary. The president names, directly or indirectly, the PRI candidates for governor in the party nominating process, the practical equivalent of being elected. Once in office, a governor can be removed by a president through a variety of legal means. The federal government has historically controlled 85 percent of public revenues. On the other hand, the states have controlled less than 12 percent and the municipalities scarcely 3 percent of the money. Regional and local authorities are therefore quite dependent on federal executive goodwill in order to fund basic services and works adequately.

This arrangement was useful in taming the anarchic sentiments which characterized state and local politics in times past, but is responsible for inefficiencies in the present era. All governors must maintain big offices in Mexico City and make visits several times each year in order to meet with the president and cabinet officials. Little responsibility is delegated, creating a tremendous administrative burden for a few at the top. Little gets done locally without a dozen approvals from Mexico City -- meaning slow progress or frequently none at all.

The present administration has implemented a number of administrative reforms to delegate greater responsibility on a state and local level. A National Consulting System set up under the auspices of the Global Development Plan establishes expanded roles for state level officials in devising and undertaking de-

velopment projects. For instance, the state governments are responsible for selecting and supervising the Zone II industrial sites which receive incentives under the NIDP. Likewise, many of the resources and institutional components of the SAM policy for agriculture are now assigned to the charge of the states.

Administrative decentralization comes as a necessary measure to reduce strains on the federal government and to improve the regional application of policies. However, a number of problems associated with state-level governments enter the picture as a partial handicap. State governments are generally short on top quality development technicians and administrators. While it may be irrational to rely on an overburdened few in Mexico City, at present the end result of regional delegation may not be much better. Since provincial public opinion is generally less organized, corruption is worse at the state than the federal level. Furthermore, state governments may not be as effective as the federal government in standing up to special interests with national standing. Therefore, while the administrative decentralizations have come as an almost inescapable reform, the results remain to be judged.

B. Infrastructure

Two types of infrastructure will be discussed here: physical and social. The first refers to the basic public utilities and works necessary to facilitate other activities. Since energy and transportation are dealt with elsewhere, here we will examine the current status of water resources and communications facilities. Social infrastructure, on the other hand, refers to the basic educational and health facilities necessary for the creation and maintenance of a productive and motivated labor force. Mexico has achieved major advances in infrastructure, but the shortcomings are equally impressive -- especially on the social side. Progress in infrastructure is dwarfed by ever-increasing demand. However, the pressures which arise from this demand can only be skillfully managed, not ignored.

1. Physical

Water has always been a scarce resource in Mexico. Although the floor of the Central basin was once covered with lakes, these were too saline or alkaline for drinking or agriculture, and water had to

be brought in by aquaduct. The government has invested billions during this century on the construction of dams, hydroelectric, and irrigation facilities. By 1978 more than 4,051,284 hectares of agricultural lands, nearly 20 percent of the economically useful lands in the country, had been brought under irrigation. In 1979 another 172,439 hectares were brought under irrigation. Dams have been built all over Mexico, but the numerous small river valleys of the West Coast are the sites of Mexico's most elaborate dam and irrigation facilities. Sinaloa has received more such investments than any other state, which explains why its agriculture is the nation's most advanced. There are those who question the true cost-benefit results of these investments. However, despite a decline in the number of potential new sites in traditional zones, the government will probably be able to irrigate another 100,000 new hectares annually for the next 10 years.

The conservation of existing irrigation zones is a major problem. Many thousands of hectares have gone to waste due either to abuse, neglect, or salinization of the water source. The Ministry of Agriculture and Water Resources is charged with rehabilitation of irrigation sites, but the process is very lengthy and expensive. Supervision and extension services will have to be increased to avoid future losses.

Rainfall has been below its historical levels for the last 10 to 15 years. Not only has this trend precipitated droughts that are disastrous to the rain-fed agricultural sector, it has also diminished the irrigated sector's productivity. In addition, hydroelectric generation had to be restricted at some sites during the serious droughts of 1978 and 1979. 1980 brought relative relief from the previous years. However, should nature continue to be ungenerous in the long run, Mexico will be forced to adopt stricter water conservation measures and to search for sources in regions better endowed with water.

The abundance of water resources in the states of Chiapas and Tabasco may prove to be the key to their long run development. Tabasco is traversed by many rivers of great flow volume. They are presently almost totally unexploited due to the state's remoteness and extremely humid climate. Past colonization attempts yielded ambiguous results at best. However, the extension of roads and basic services may eventually attract enough cultivators to unlock the state's great agricultural riches. Chiapas is also well-endowed with rivers. At present, several major hydro-

electric sites are under development there. These promise to provide abundant energy to regional cities and to attract industry.

Mexico City's water problems are formidable. The city began to bring in water by canals from the north in the 1940's. These have been progressively expanded over the decades -- not, however, without serious conflicts arising. Much of the water comes from deep wells in the state of Hidalgo. With the voracious increase in industrial and consumer water appetites, local agriculture has been all but deprived of pure water sources. The farmers were offered, to their chagrin, the city's sewage wastes as a means of irrigation. The potent chemicals and contamination therein ruined the lands and destroyed production in less than 10 years. New wells are continuously being drilled which the government indicates will meet the city's need for another 15 to 20 years. However, shortages became severe during the droughts of 1978 and 1979. Services had to be rationed in some zones or completely cut during certain hours. In all likelihood, consumption will continue to outpace supply and water will remain a big constraint on expansion of the metropolitan area.

2. Social

a. Communications

Communications is a field where Mexico has made great advances in tying together the nation and providing services essential to industrial and commercial growth. Nearly the entire country has telephone, radio, and television service. A microwave network built during the 1960's and 1970's brought together formerly isolated regions. However, the intensity of telephone and mass media services still has a long way to go to reach developed country standards. The number of telephones per hundred inhabitants increased from 1.5 to 5.5 between 1960 and 1978. By comparison, the number of telephones per hundred inhabitants in Brazil rose from 1.5 to 4.4 during the same span. In the United States the number increased from 39.5 to 74.4. Obviously, this is not to suggest that Mexico must reach United States levels of telephone service intensity, but expansion will certainly need to continue rapidly as the country grows. The country's INDETEL telephone utility, a Mexican State-ITT joint holding (67 percent Mexican, 33 percent ITT), seems to be capable of meeting the challenge.

Radio continues to be the mass medium of greatest social reach and consumer penetration, but more and more Mexicans are becoming television addicts. Eighty-four television receiving units were in use per thousand inhabitants in 1975. This is low in comparison to the United States figure of 571. However, the consumer market reached by the tube in Mexico is large by developing country standards. Mountainous terrain impedes signals from reaching many rural zones, but nearly all of urban Mexico -- both rich and poor -- will have access to television by the end of the century.

The printed media reaches vast audiences through comic books and sports and sensationalistic tabloids. As such, they are effective advertising instruments. Efforts to use the popular press for more educational purposes have not had great success to date. Mexico's government issues free textbooks for use in the national primary schools. Nearly all remaining printed materials reach only an elite audience. Expansion of the demand for more sophisticated texts, manuals, journals, and references will depend on increasing the educational and income levels of the working masses.

b. Education and Training

Educational deficiencies and imbalances are a paramount constraint on Mexico's ability to create a modern labor force. Man-power abundance alone does little to solve personnel problems. Mexico's labor may be low priced, but it is certainly not low cost when low productivity and high training costs are taken into account. There is presently a severe shortage of skilled technicians and workers. Unfortunately, Mexico's school system is doing little to satisfy that need.

The nation-wide schooling average is currently about 3.8 years. The proportion of attendance among school age children has increased in recent years, but it continues to be the case that only 46 percent of the children complete the six year primary school cycle. The proportion of GDP spent on education rose from 1.7 to 4.9 percent between 1960 and 1976, and primary school enrollment climbed from 5 to 12 million, but it is estimated that up to a million children go without schooling due to a lack of facilities. Many dispersed rural communities continue to offer only three years of classes. The 1977 Education Plan calls for the extension of obligatory schooling from 6 to 9 years; however, this is patently unrealistic as long as the retention of students through the current

6 year cycle fails to improve.

Efforts have been made during the last 10 years to increase the practical and vocational orientation of primary and secondary education. This has not been a success story thus far. Attempts at designing new programs have yielded no big improvement in job placement. Graduates of the 6 year primary cycle and the 3 year secondary cycle still depend in large part on service and commercial sector jobs of low productivity.

Mexico's overcrowded universities reflect a crisis of distorted values and misplaced resources. Between 1970 and 1980 university enrollment soared from 270,000 to over 600,000. Currently, over 10 percent of the population between ages 18 and 26 pursue advanced education of some sort. However, few of these students will complete their degree programs and fewer will obtain gainful employment in the field for which they prepare. A university degree remains the key to elite status; hence, political pressures are applied in behalf of continued expansion of the superior educational system, rather than in favor of mid-level vocational and technical training. The national and regional universities will continue to absorb a great portion of the federal and state education budgets, at the expense of improving secondary programs.

The Ministry of Education was authorized to spend \$5.9 billion, about 13.7 percent of the government budget, for fiscal year 1981. This represents a 44 percent nominal increase over 1980, but the increase will still fall short of needs even if inflation falls from 28 percent to 22 percent. Beginning in 1980, the government has required industries to establish training programs for new workers. However, in the absence of any incentives or enforcement apparatus, this can be treated as little more than a statement of recommendation. The greatest incentive will remain spontaneous: the sheer lack of skilled manpower. Firms will have to set up inside training programs since the public system will not provide the skilled workers they need.

c. Health

Mexico's performance in health services is inferior to that of many countries with a lower per capita income than its own. In 1975 Mexico ranked seventeenth in life expectancy and twenty-third in infant mortality, out of a total field of 33 western hemisphere republics. Parasitic and infectious dis-

eases, plus pneumonia and tuberculosis remain leading causes of death. Mexico produces some of the most highly qualified medical specialists in the world. Hospitals are built with all the latest technology and facilities. At the same time, however, over 25 million of Mexico's people are without any effective health services.

Mexico dedicates about 4.3 percent of GDP to public health expenditures. The nation's social security system, comprised by the IMSS, ISSSTE, and several other organs of lesser importance, covers about 22 million people. It is financed by labor-management-state contributions and serves the nation's urban industrial, clerical, and government workers. The meager facilities of the State Health Ministry manage to serve roughly an additional 20 million people. The remainder -- the masses of urban and rural poor -- seldom or never see a doctor or dentist.

The present social security apparatus is designed to expand at the pace of the modern economic sector at large. Critics argue that it would be better to spend more and spend it more evenly in order to provide a more modest health service to a larger number of people. Politics and expediency dictate otherwise. It seems unlikely that the organized and privileged sectors would accept the sacrifices implied for them by a broadening of health coverage. Efforts are being made to open clinics in smaller communities.

Some agricultural sectors (sugar, coffee, hemp) have been brought under a limited protection, but only a fraction of the rural population enjoys coverage of any kind.

Within the values and parameters of the Mexican health system as it is, the principal constraints have to do with the preparation and utilization of personnel and extension of the services beyond the major cities to smaller towns in the modern economy. At present, the ratio of doctors to registered nurses is 3 to 1, whereas it should be just the opposite. Another problem is that the social security system is only able to employ 1800 of the 8000 new doctors which Mexico's universities graduate annually. A portion of the remainder enter private practice, but many find themselves unemployed. Few doctors can maintain a comfortable living standard in any private practice outside the largest cities. Over 50 percent of Mexico's doctors and dentists reside in Mexico City and its environs alone. The result is that, whereas Mexico had 60,000 doctors in 1977, with a national ratio of 1,063 inhabitants per doctor, half the popula-

tion was faced with a de facto ratio of one doctor per 6000 persons. Over 1,100 towns, with a combined population of 5 million, had no doctors at all. Given the scarcity of health services in many regional cities, not to mention the rural areas, it is difficult for industrial enterprises to decentralize or relocate.

CHAPTER FOUR
IMPLICATIONS AND POLICY OPTIONS

IMPLICATIONS AND POLICY OPTIONS

For many decades Mexico had relatively little economic importance for the United States, while, for its part, Mexico sought vainly to escape dependence on its northern neighbor. Given this history, it is ironic that in the 1980s these coinhabitants of the continent will find trade with each other to be of such enormous significance. The consequences of proximity and the inherent complementarity of these two diverse countries, plus the explosive growth of Mexico's oil-driven economy, will naturally quicken their economic relationship. Each country could be made wealthier and more stable because of the other, but it is also possible that trade, immigration and labor tensions could disrupt the relationship and generate serious political strains.

In the next few years Mexico and the United States will find their trade relationship more demanding, more delicate, and potentially more exacerbating than at any other time in their turbulent history. Trade could become an issue more troubling than immigration.

The exposure of Mexico to trade and immigration policies of the United States which affect a large number of Mexican jobs, is one potential flashpoint. Mexico's new policies of producing oil at a fairly conservative rate, selling a lesser portion of it to the United States, using oil and gas at home to promote industrialization, and using oil internationally to bargain for technology and investment from other countries -- may make perfect sense for Mexico, but may be misunderstood in the United States. The United States could begin to view Mexico simply as a wealthy oil country and fashion trade policies accordingly, when in fact Mexico is a country half developed, half poor. In a similar fashion, Mexico could misread the United States by failing to perceive the special concern in this country about loss of jobs to Mexico.

Mexico is already sensitive, as well as justifiably skeptical, about its neighbor, while the United States has historically exhibited an insensitivity characterized by both neglect and an optimism which at times appears to the Mexicans to be naive and quickly disillusioned. Moreover, for all the emphasis on maintaining constant consultation, the relationship lacks structure. The officials in each government respon-

sible for maintaining the relationship between the two countries face extraordinary difficulties in the next few years. They must exhibit uncommon understanding and statesmanship. Disagreements are to be expected, particularly in foreign policy. Yet beneath the inevitable rhetoric it is imperative that each country understand the true concerns of the other, and understand that the welfare of each inherently affects the welfare of the other.

The Reluctant Symbiosis

In every significant dimension of national policy, Mexico will be one of the four or five most important countries for the United States in this century. In terms of national security, one need only observe the significance the United States has attached to small or distant countries to judge how much more important is the welfare of a large country on its border. The United States and Mexico share the longest border in the world between a developed and a developing country. Nowhere else on the planet does an imaginary line demarcate, for example, wage differences as great as 13 to one. More trade with the United States moved across this border than trade with all but two other countries, Japan and Canada. By 1985 Mexico will probably have grown to become our second largest trading partner. Trade between the two has tripled in less than three years and will very likely double again by the middle of the decade. United States exports to Mexico have increased more than 50 percent in each of the last two years and will continue to increase, if at a somewhat lower rate. Farmers in America will find Mexico to be one of its two or three best markets in this decade.

Mexico now has the fifth and could eventually have the second largest reserve of oil in the world. Although it could occasionally run a trade surplus with the United States, Mexico will carry a large current account deficit with this country (it was \$3.5 billion in 1980) for the foreseeable future.

The statistics, however, fail to convey some new, as well as old realities. In one sense, Mexico has taken a quantum jump, a leap forward in confidence and ability. In another sense, much of Mexico remains extraordinarily poor and underemployed. On the one hand, the United States is still the world's richest industrial nation. On the other, it is a nation which has reached maturity and has struggled, with consider-

able self-doubt, to regain the initiative and growth it enjoyed for decades. This phenomena of a newly confident, young, expanding but still half-poor nation, living side-by-side with a mature industrial giant striving to get back on its feet is one of the realities that must be appreciated by both countries. The people of both countries could easily misread the other.

For 18 months in 1979 and 1980 Mexico grew faster than 7 percent a year in real terms while the U.S. growth rate dropped below zero. In the years 1980-82 Mexico will create 2.2 million jobs, while the United States, with a gross national product twenty times its size, was expected to create only four million jobs, at least before the new Administration took office. For the rest of this century Mexico predicts an annual growth rate of 10 percent. Even if it falls short, as we believe it will, its growth rate will tend to be twice as fast as that of the United States.

Plans vs. Realities

Mexico's ambitious goals, and plans for carrying them out, will very likely have to be revised in the light of the constraints laid out at the beginning of this study, and in light of international market realities.

Inflation is already undermining the economic plans, as well as placing the exchange rate for the peso -- which is denominated in terms of dollars -- at a level which seriously harms Mexican competitiveness and slows foreign capital inflows. This intensifies the need for special subsidies, incentives, and export requirements, which further distort the economy and raise the prospect for U.S.-Mexican trade confrontation. Recently, there has been a stagnation of non-petroleum exports, with a precipitous decline of the share of manufactured goods as a percentage of total exports (from 36.6 percent in 1978 to about 15 percent in 1980), and a growing share attributable to oil exports.

While trying desperately to avoid overdependence on oil and falling into the so-called "petroleum syndrome," the government has already found itself with excessive fiscal dependence on the petroleum sector. Adding to the difficulties, energy consumption has risen domestically far out of proportion to growth, reflecting the artificial cost of energy.

The external accounts have further been damaged by unanticipated slackening of demand for Mexican exports with the slowdown of the U.S. economy, and by outflows of tourism and of capital seeking high U.S. interest rates, which in turn has forced Mexican rates upwards, generating further inflationary pressures. Bottlenecks in key sectors, particularly transportation, food, and raw materials, are aggravating inflation, and in turn inflation is intensifying pressures on the wage and fringe benefits front. A slower growth performance in the 1980s, as compared with the 1970s, now seems inevitable unless the petroleum sector is used even more to boost the rest of the economy.

The huge labor pool available in Mexico is not what it seems. There is a severe shortage of skilled labor, and an overabundance of unskilled labor, leading to further distortions in the industrial centers, especially Monterrey. Regional imbalances are also generating tensions and calls for further efforts to redistribute economic gains towards low productivity uses.

The awesome problems and constraints suggest a slowdown in growth, with continued high inflation. The growing gap between plans and reality will prove to be a major source of disappointment. This could lead Mexico to negotiate more actively with other nations, or it could lead to retrenchment and a new surge of economic nationalism. In the 1980s, Mexico may well find itself balanced on a knife-edge between aggressive nationalism and mercantilist trade policy on the one side and more pragmatic, internationally oriented policies on the other. U.S. attitudes and posture toward Mexico are likely to influence which way Mexico leans.

The World Market Environment

Another hard reality is that global market conditions are perilous in the 1980s. The growing interdependence of national economies; the rapid intensification of global competition as a result of new entry of competitors; rapid technological advancement of traditional competitors like Japan; and other global changes are generating profound stresses on the existing industrial and labor base in many nations -- including the United States. Most experts expect the 1980s to bring economic turbulence and major problems of industrial and labor adjustment in many of the major trading nations. After three decades of widely

shared global economic expansion, the United States and Mexico, as well as many other nations, now face low growth and high unemployment; stagnation; inflation; and in many nations, growing debt. Third world countries stagger under the weight of new oil price rises which threaten national financial viability, while protectionist sentiment grows in the major importing markets of the developing world.

One consequence of the slowdown in world growth and world trade is that nearly every country in the world is endeavoring to limit imports and increase exports. Major exporters are trying to increase their market share with ever-more concessionary credit, while countries both rich and poor concoct complex subsidies which they hope will escape the legal restrictions of international agreements. Co-production and performance requirements are being used to induce new investments in production for export as well as for import-substitution. Even the United States is rethinking its traditional concepts of competition, and considering relaxation of antitrust laws to allow exporters and bankers to form export trading companies. Even the United States is increasing pressure on foreign competition to invest in this country as one part of its access to the U.S. market.

At some point this considerable activity is self-cancelling. If most countries are promoting exports and aiming to limit imports, not everyone can export their desired volume. This means that special or favorable relationships between two or more countries, such as between France and her former colonies, may become even more important.

Mexico's hopes for export diversification have already been blunted by European hesitations and resistance to labor-intensive imports. The Europeans so far have wanted to trade industrial projects for oil, and not for traditional manufactured imports. A significant change in European attitudes is not likely in the 1980s.

For the most part operating outside international agreements, the United States and Mexico have built up what is in fact an economic relationship which is special. But Mexico is highly vulnerable to changes in this relationship. Nearly 800,000 jobs in Mexico, out of a total work force of 18 million, can be attributed directly to three aspects of U.S. trade policy: winter vegetables, border industries, and Mexico's portion of GSP (Generalized System of Preferences) trade with the United States. It is in trade policy and in immigra-

tion (which provides Mexico with between two and four billion dollars in repatriated income) that Mexico is most vulnerable and exposed. Retaining, expanding, or reducing each of these will be important issues, immediately and throughout the term of the new Administration. Assurances about the stability of what is already in place will be of vital importance to Mexico.

The Immediate Situation

Neither partner is quite sure of the relationship, nor of how to go forward. There are some in the United States who have suggested broad new economic arrangements, or even a common market, but these are simply not acceptable to Mexico at this time. In the near term, the timing is poor for developing new arrangements, since Mexico's President will soon announce his successor and thereafter his political power will begin to diminish -- just at the time when a U.S. President might wish to sit down for the purpose of normalizing and opening the relationship.

It can be said that in the United States both the new Administration and the Congress are favorably disposed toward Mexico. In Mexico, President Lopez Portillo has completed a remarkable four years of economic recovery and political consolidation, creating a self-assurance which reduces Mexico's traditional frustration with its dependence on the United States. These two facts ought to make progress between the two countries possible. In fact, however, Lopez Portillo will likely name his successor in the summer of 1981, see him nominated by the party in the later half of that year, and watch political power slip away during the subsequent one year "campaign" by the next President. The U.S. Administration thus actually may have only a very narrow window of time in which to develop the basis for any new agreements or working arrangements with Mexico, after which it may have to wait for a new Mexican Administration to get into stride.

It is not within the scope and purpose of this study to speculate on short-run tactics. Whether a truly comprehensive agreement -- one which involved energy, trade and immigration in whatever form or however denominated -- could be made between the two countries in a limited time is questionable. The conventional wisdom would conclude that those who seek to hit a home run will often end up striking out.

It has been assumed here that substantial new arrangements between the two nations will take time to develop or to negotiate, and that the beginning phase of a new relationship does not necessarily entail the same risks as the later stages. A shift in direction now may provide the basis for a profound change in the relationship in later years.

Need for a Framework

Today there is no agenda, no established procedure, no coherent framework for the U.S.-Mexican relationship. There are special arrangements, like the border industries. A modest U.S.-Mexico Consultative Mechanism has been started by Presidents Carter and Lopez Portillo. There are a number of joint commissions quietly doing useful things. Conferences and studies abound.

Officially, the United States at the end of the 1970s pursued two distinct strategies towards Mexico. On the one hand, the United States contorted its normal governmental decision-making procedures and organization by creating a special Ambassador for Mexico, attempting to centralize U.S. dealings and give a higher, special status to the relationship. This organizational gesture was not understood or appreciated in Mexico. On a separate track, the United States worked vigorously to draw Mexico into the multilateral framework of the GATT and of the special codes of conduct that were negotiated in the so-called Multilateral Trade Negotiations (MTNs), which were concluded in 1979. But in March, 1980, President Lopez Portillo finally decided that Mexico would not join the GATT. The laboriously constructed U.S.-Mexico agreements reached during the MTNs were aborted, and even worse, Mexico was put in a more unfavorable position than many other nations by the conditions of U.S. law and the new international codes.

There once was a bilateral, reciprocal trade agreement between the two countries, concluded in 1942. But it was allowed by Mexico to expire in 1950, mainly because Mexico sought freedom of action to embark upon an active import-substitution policy and a trade diversification strategy designed to reduce dependence on the U.S. market.

Now there is no logical, comprehensive framework within which trade is conducted. While the general

lines of U.S. trade policy have remained constant for three decades or more, Congress can change the rules, and private actions can alter the circumstances, of market access for particular products. Mexico's trade policy has been characterized by frequent changes and arbitrary administrative practices. Trade takes place in an unstable, unpredictable environment, with erratic changes in conditions occurring periodically on both sides of the border. This uncertainty not only works against long-range planning and investment commitments, but it also acts as a trade impediment in the short-run.

The need for some kind of framework is greater now than ever before: first of all, Mexico is now in the position of being treated differently from most other countries as a consequence of its decision to reject GATT membership and to reject participation in the codes which emerged in 1979 from the decade-long Geneva trade negotiations. The codes require nondiscriminatory treatment among those who joined, but non-participants are treated differently. When the U.S. law which implemented these new multilateral codes was drafted in 1979, this differential treatment of non-members was carried through into the U.S. trade laws. Now, Mexican trade policies and practices which fall under the unfair trade practices sections of the U.S. law are especially vulnerable.

A particularly sensitive matter is the treatment of Mexican export subsidies under the U.S. countervailing duty statute. It is virtually inevitable that U.S. producers or workers will bring cases under this law, and consequent actions will often be automatic inasmuch as no injury will have to be demonstrated in the case of nonparticipants of the GATT codes. This problem is even greater than it may at first appear at the beginning of 1981. Mexico's widespread export incentives are one problem. Mexico's energy policies, aimed at keeping domestic oil and gas prices well below world market prices, and Mexico's special energy subsidies, will generate claims of subsidization in the United States. Not only are product sectors like petrochemicals vulnerable, but all energy-using industries such as ferrous and nonferrous metals and forestry products are as well. This may seem ironic, since U.S. industry and agriculture benefited from favorable internal oil and gas prices for years. However, now that the U.S. economy must adjust to world market prices, its industrial and other business enterprises will no doubt complain about "unfair" or officially distorted oil and gas prices in the home markets of competitors like Canada and Mexico.

Mexico's industrialization policies and treatment of foreign investment under these policies often involve so-called "performance requirements." Foreign enterprises are required to export at some target level in relation to the level of activity of their Mexican operations. One criterion is to offset the expenditures on imports, but there are other conditions which require further export generation. Key, sensitive sectors are covered by this policy. One example is the automotive sector. Continuing pressures to limit automotive imports into the United States, at least from Japan, and the expected technological change in the United States industry (e.g., world-car sourcing) are likely to combine to generate new pressures for unfair trade cases against Mexico.

Pressures have also built up in the United States to diminish the scope of the GSP and the border industry special treatment (Sections 806 and 807), so vital to certain Mexican businesses. In particular, there is a growing opinion in various quarters of labor and industry, as well as in Congress, that "graduation" of countries out of GSP treatment, for certain products, should be accelerated where those products are produced and traded on a globally competitive level. These pressures have already resulted in a March 20, 1981, decision by the United States to impose duties on a half billion dollars worth of products from five middle income countries. In this initial graduation decision Mexico was not seriously affected. However, the present trend in Congressional thinking is to accelerate the graduation process, particularly for the advanced developing countries such as Mexico.

But beyond these imminent difficulties is a far more fundamental problem. The U.S. Constitution created a foundation for trade policy and trade practice which is highly legalistic. Under the Constitution, the Congress regulates foreign commerce not the President. This requires special bridging devices and ongoing informal cooperation between the Executive Branch and Congress, without which the President cannot function. Added to this special problem of bridging these diverse bodies, with their fundamentally different responsibilities and constituent sensitivities, is the clear separation of public policy and private enterprise actions in the American economic system. The means by which these complex interactions have been managed is through drafting of highly elaborate trade laws, which spell out rights of private enterprises and workers, the degree of administrative discretion of the Executive Branch, and the

procedures for action and for judicial appeal. These trade laws have been made more precise by Congress in recent years, to the point that Presidential policy and exercise of administrative discretion by the government is severely constrained, whereas the freedom of action of private producers and workers to call for special import duties or other restrictions under various procedures has been maintained. Private actions in the 1980s increasingly can, and very likely will, alter the conditions of trade between the two countries.

The two nations are now most likely on a collision course. It has therefore become imperative that some kind of new understanding or arrangement be developed to handle the problems which are likely to arise with increasing frequency and severity.

The Present Arrangements

Procedures for raising and, in some cases, resolving disputes or new problems do exist at the present time. The so-called Consultative Mechanism created by the two governments has generated a series of formal meetings involving nine working groups as well as a number of technical subgroups. The work is carried out under the following headings:

- The Border Cooperation Working Group
- The Trade Working Group
- The Industry Working Group
- The Energy Working Group
- The Finance Working Group
- The Migration Working Group
- The Legal Affairs Working Group
- The Tourism Working Group
- The Agricultural Working Group

Among these groups, the first two have been fairly active, and have had some modest successes. Progress has been made in the form of new agreed procedures in such areas as marine pollution and co-operation in natural disasters. Exchanges are continuing on several other border matters, including management of bridges and crossing points, and border housing, sanitation, health, and environmental cooperation. The Trade Working Group and its subgroups have tried to establish a problem-solving mechanism, including a procedure of notification and prior consultation, but this as yet operates only in an ad hoc manner. The work of this group did contribute to

resolution of certain specific trade issues: the U.S. treatment of fresh winter vegetables from Mexico, and U.S. implementation of various concessions affecting imports of litharge and other lead products in exchange for a Mexican action to fix the tariff on aluminum strips used for bottle tops. The other groups have started a process of mutual education which could lead to improved dispute settlement procedures, but it is too early to evaluate them.

In addition to this consultative procedure, there are other official activities aimed at technical problems. Perhaps the most prominent is the International Boundary and Water Commission, but others, noted earlier, include groups on foot and mouth disease, plant and quarantine inspection, cultural cooperation, and exchange of information in selected areas of science and technology.

Other than these tentative and irregular consultative devices, there is no recognized and broadly accepted means for resolution of disputes. In the case of the United States, many Executive Branch policies and much of its discretion are constrained by U.S. legislation, as a consequence of the Constitutional separation of powers and the Congressional desire to specify Executive authority in some detail. Moreover, in this divided U.S. system, informal pressures and public proceedings (e.g., Congressional hearings, consideration of bills which may not see passage, log-rolling on unrelated issues) can have significant influence on Executive Branch policy where discretion is provided in the law. Thus, if the Executive Branch wishes to interpret the law in a particular fashion (for instance to ease a Mexican trade problem), it must consider Congressional reaction and potential new Congressional strictures before exercising administrative or policy discretion.

This elaborate array of legal, administrative, and negotiated arrangements which make up the ground rules for U.S. decision-making are neither well nor widely understood in Mexico.

The U.S. Executive Branch has attempted to ease inherent tensions and facilitate coherent decisions by reorganization and centralization of Executive Branch dealings with Mexico. This can, of course, help create a degree of consistency in otherwise conflicting or divergent policies and practices. But Executive Branch centralization cannot readily resolve difficulties which arise out of conflicts between Congress and the Executive, or between private enterprise and public

policy, particularly in the trade field.

To manage these conflicts and give policy decisions a durable character, there must be some new kind of juridicial framework within the United States.

A juridicial framework does exist at present, but it is based on differential treatment of countries which join the GATT and the international codes agreed upon in 1979. A different framework, which recognizes the special circumstances of the U.S.-Mexican relationship, might conceivably begin on the basis of the small amounts of administrative discretion to be found in U.S. law. However, that discretion cannot ultimately be exercised freely without taking into account Congressional sentiment. Even then, the present discretion is insufficient to cope with substantial private sector activity in pressing for fair trade remedies and other remedial measures. Eventually, a durable series of decisions will require a sound foundation in law.

In essence, there are two long-range alternatives to the present ad hoc relations open to Mexico in its commercial and other economic relations with the United States:

(1) Join the GATT and the codes on nontariff trade measures, or

(2) negotiate with the United States a new trade, investment, and commercial relations accord which could be implemented, approved or supported by the Congress.

Options for a New Framework of Trade Cooperation

There are a number of alternative U.S. postures and U.S.-Mexico frameworks that might be considered:

(1) Treatment of Mexican problems by the United States on a strict reciprocity basis. Many Washington officials, based on their experience with Congress as well as with management of relations with other governments, believe that a tough negotiating stance based on strict reciprocity is the only viable, or desirable, option given Mexico's intransigence regarding multilateral rules and obligations, such as those laid down in the GATT and its codes. This approach has two fundamental flaws, however. First, the United States will often need special legislative authority to take

any specific action, whether on a reciprocal basis, or otherwise. This runs the risk of inordinate pressure on Congress from special interest groups and inordinate pressure from the Congress on the President over specific issues. Second, Mexico believes that the relationship is already one of unequals, and efforts to require strict reciprocity represent an attempt at perpetuating inequalities. Politically, it is difficult in Mexico to build an ongoing relationship of commercial cooperation on the basis of the rhetoric of reciprocity. Rather, an opposite effect of the rhetoric will tend to occur. The Mexican government would often feel it must create new problems for U.S. interests in Mexico, or for other U.S. industries, in order to create "appropriate" conditions for reciprocal bargaining. This approach, if formally established by the United States as its doctrine, would therefore tend to generate a growing number of conflicts, on an expanding scale.

Thus, strict reciprocity may have to be the basis for near-term relations, if no other option is tried, but it will most likely generate new tensions.

(2) Treatment of Mexico as if it were subject to the same rights as members of the GATT and of the MTN codes. This is not easy under present U.S. law, but there are some areas of discretion, particularly in the permissive authorities to accept commitments or assurances which give rise to effects similar to those which would be achieved under the GATT codes. However, this is feasible only if Congress does not balk. Moreover, it would not prevent private action against Mexican exports to the United States, within the framework of the present laws which implement GATT and MTN rights and obligations.

(3) Negotiations of a U.S.-Mexican common market. This is patently unrealistic at this time, since it would require a common external tariff for the two countries and free movement of goods between them, drastically changing Mexico's industrial and agricultural plans. Even if phased over several years, it would alter long-term investment plans, not only of the United States and Mexico, but of other nations interested in the U.S. and Mexican economies. To prepare for such a massive undertaking would take several years and a fundamental political reassessment within Mexico. It would also require in the United States a major reappraisal of the U.S. labor market and industrial structure, as well as a reappraisal of the future of the Southwest and the Sunbelt. Not only the government, but workers, farmers, and businessmen would want to think this through.

(4) Negotiation of a U.S.-Mexico free trade area on a special, elongated timetable. This would allow the two countries to maintain different tariff schedules towards the rest of the world. It could be accomplished by a complex formula starting with a few key sectors and gradually, over a number of years, expanding its coverage. The timetable for the two countries need not be the same. The precedents already established by the EC nations in their relations with various associated countries and long-term aspirants for membership could provide appropriate GATT justifications. The ability to move selectively and slowly, while maintaining a long-term objective of free trade, would make this approach agreeable from the point of view of maintaining mutual freedom of action for a long period. On the other hand, it would create serious fears and apprehensions in Mexico, both politically and economically, and would therefore necessitate careful preparation. It would seem to go against recent Mexican efforts to moderate or slow down the process of trade liberalization. Given the disparities in energy and labor costs, U.S. workers as well as companies might object vigorously to the opening of free trade in any sector which has significant economic activity in the U.S. at this time.

(5) Negotiate a preferential tariff and trade agreement between the two countries and justify it internationally on the grounds of the special circumstances of the relationship, including the contiguity, cross-border flow of people, and massive disparities in income and well-being. This presents a great challenge, inasmuch as (a) other Latin American and Caribbean countries might feel discrimination against them, and push for similar arrangements, and (b) other Western industrialized countries might complain that their terms of access were relatively disadvantageous, thus generating pressure for additional bilateral arrangements with Mexico, and encouraging new, discriminatory special arrangements by the EC in particular with various other developing nations (in the Middle East and Africa especially).

(6) Develop a specific package of actions and concessions between the two countries which addressed some of the likely problems as well as mutually beneficial opportunities. One such package widely discussed would cover immigration, trade relations, and energy. Such a package, to be meaningful, would require various Congressional actions, and would therefore run the danger of numerous alterations and imposition of conditions by the Congress. If it were negotiated at one point in time, with specific elements in the package, it would rapidly be made obsolete by technology, new conditions of competition from other nations, private trade complaints, etc.

(7) Development of a special procedural framework for managing the relationship which would address current or anticipated problems and which would provide special means of dispute settlement. Such a framework could begin with an understanding between heads of government, committing their respective policy-makers to provide opportunity for consultation and early warning. It could assure a higher degree of transparency in the administration and policy making processes on both sides of the border. The U.S. process of lawmaking and administrative action already assures a high degree of transparency, but this is not well understood in Mexico. The Mexican decision-making process is far more opaque and erratic, and inconsistent decisions emanating from various points in the government are the rule rather than the exception.

This approach could gradually be expanded to address more fundamental issues such as cross-border migration and industrial strategy. The present treatment of cross-border people movement is untenable, and corrupts the laws. Some modus vivendi is needed which regularizes the status of migrant or transient workers, as well as the status of long-term residents from across the border. While the issue of industrial strategy may at first seem too politically sensitive, U.S. actions in its own sensitive areas, like the automotive industry and the steel industry, are likely to have far-reaching effects on Mexico in the long run. Mexicans, too, may want to consult on the objectives and techniques of U.S. industrial policy insofar as it affects international trade and investment flows, as well as access to markets.

Given the existing competition for authority in a complex Mexican administrative system that typically generates ad hoc decisions without attention to their general consistency, many Mexican officials will be reluctant to accede to new procedural commitments which tie their hands. The distinction in the United States between private initiatives and public policy, especially in the trade area, would also be likely to discourage Mexican participation in rules that bind Mexico as a whole.

The present U.S.-Mexican Consultative Mechanism may perhaps provide a foundation. However, a number of participants feel that this mechanism has not been sufficiently effective, and that in the trade area the best method of ensuring special consideration of Mexican problems is informal and off the record, quietly consulting interested members of Congress where necessary.

A special procedural framework, with special means of dispute settlement, would, on the U.S. side, almost certainly require Congressional acquiescence in support of legislative interpretations, at least in the initial stages. This would not suffice for long, however, because of the inherent rights of private parties to protect their interests as defined in the U.S. law. Therefore, bilateral agreements would have to be negotiated to substitute for the multilateral GATT framework which Mexico has shunned, or the U.S. trade laws would have to be amended to give differential treatment to Mexico. A review of U.S. laws would be most difficult to accomplish without some major quid pro quos (e.g., acceptance by Mexico of strict reciprocity; assurances of energy supplies in times of tight markets or emergencies; major alterations in Mexican subsidies, performance requirements, and oil and gas pricing; etc.).

(8) Devise a Continental Accord with Canada and Mexico into which the Mexican relationship would fit. Normally such an accord would include some expression of common aspirations, reciprocal treatment of investment and rights of business establishment as well of trade, and consultative procedures before actions affecting other parties are taken. Canada would have great difficulties committing itself to any of these elements, at least during the life of current government in Ottawa, which has accentuated some of the traditional anti-American policies and attitudes and placed new emphasis on "Canadian" solutions to economic problems. Such an accord might be centered around common security interests, but this could pose serious political problems in both Canada and Mexico, given their differences with the United States over foreign policy. Nonetheless, an accord expressing the intent of leaders to bring about more harmonious relations and expanded commerce, based on "special relationships," might conceivably be developed. Its character could be more procedural than substantive at its initial stages, with a view to developing substantive agreements over time within a common framework of objectives.

Within such an accord, the specific U.S.-Mexican issues would still need to be addressed in sub-arrangements, and such sub-arrangements could have to take into account the options and considerations enumerated above.

Is There a Role for General Understandings?

Politically, in the time frame of the next two years at least, a comprehensive agreement -- or "basket solution" as Lopez Portillo once called it -- is not in the offing, but a broad understanding about the behavior of the two nations toward each other should be obtainable. Such an initial understanding could be based on an appreciation by each country of the positions of the other, and could include agreements to disagree. It could include an appreciation and tacit acceptance of each country's principle policies without retaliation or efforts to undercut the other. For example, there is room for mutual recognition of the broad policies of both parties on energy: Mexico's desire to diversify sales, the United States' desire for additional global energy capacity (even if it does not generate sales from Mexico to the United States); of the United States' need to take some kind of action on immigration and a recognition by both countries of the need to create additional employment in rural Mexico where most immigration originates; of Mexico's intention to become self-sufficient in beans and corn, and the U.S. desire to provide feed grains as needed.

While these "understandings" may appear to be no more than acceptance of the obvious and immutable, there is a qualitative difference between merely exchanging views, and a recognized procedure for developing appreciation and tacit acceptance, including agreements to disagree. Not only would surprises be avoided but the grounds could be laid for specific sectoral agreements, and eventually even larger agreements.

Broad understandings of this type are particularly important in dealing with Mexico. When Mexico published its Global Development Plan -- which would be considered primarily an economic document in most countries -- fully half the plan was devoted to the relationship of the plan to the revolutionary ideology of Mexico and how the economic plan fits Mexican society and politics. To deal effectively with Mexico it is prudent to give importance to placing international negotiations, discussions or agreements in this context, of making them consonant with history and culture, and of operating within some kind of mutual consensus on international issues as well. To expand and improve trade with Mexico, and reduce bilateral frictions, the United States must pay closer attention to communication, appreciation of culture, and coordination.

Communication, Culture and Coordination

The most celebrated and damaging phrase to overhang the relationship in recent years came from President Lopez Portillo when he said he was "left hanging by a paintbrush" when the United States pulled the ladder out from under him by rejecting Mexico's natural gas contract in December, 1977. The President was publicly humiliated and consequently devoted that same gas to converting domestic industry to gas at great expense and cost in efficiency. Officials at the U.S. Department of Energy will argue that the decision has since been justified on the merits and that, in any event, the United States told Mexico through its gas companies what to expect. Yet this episode continues to haunt the bilateral relationship, for good reason. Not only was the decision delivered to PEMEX Director Serrano (now a dark-horse candidate for President) as if he were a used oil salesman, but the Mexican government was without fair warning. Mexican officials did not assume the United States would choose gas companies to communicate its intentions, and belated and mixed signals from the United States embassy were of little value. The U.S. government allowed the decision to be made solely on the basis of domestic gas pricing tactics, particularly in relation to Congressional maneuvers on gas policy. For some in the United States this is justification enough, but in the larger context it illustrates dramatically the need for greater predictability and sensitivity in the relationship.

This report has stressed history in a number of sections because of its vital role in determining current attitudes. We place the same emphasis on understanding differences in culture. No one familiar with the history of petroleum in Mexico as it relates to the United States, or with the manner in which one conducts business in Mexico, would have made the natural gas decision as it was made in this case.

One reason it was possible for such an incident to occur is that authority in the U.S. governmental system is diffused so widely. The U.S. Energy Secretary decided what his department considered to be an energy question. The Energy Secretary was able to make such a decision notwithstanding a differing position held by the Ambassador and by the Department of State. Instead of coordination of policy, one actor with a strong opinion held sway.

The Mexican reaction to the natural gas decision was one reason for the Carter Administration decision to establish the position of Special Ambassador for Mexico to coordinate U.S. policy. The bewildering complexity of the United States political and administrative system calls for better coordination when dealing with Mexico. To a large extent the choice of a coordinator, the authority given to that official, and the degree of involvement by the Presidential staff determine both the importance of any foreign relationship and the effectiveness of coordination. The last administration chose to respond to an obvious substantive need with an organizational change. It is not within the scope of this report to suggest a method of organization or a focus for decision-making. We stress, however, that far greater coordination will be needed in this Administration, however expressed, even though organizational changes alone cannot substitute for a new framework for the relationship.

One reason for stressing the three C's of communication, culture and coordination, is apparent when considering foreign policy. The foreign policies of the United States and Mexico inevitably diverge. This is not an accident of who happens to be President in Mexico, as it may to some extent be in the United States. Rather, Mexican foreign policy reflects Mexico's revolutionary ideology. Even when economically conservative at home, Mexico represents itself abroad as moderately revolutionary, sympathetic to Third World causes, and anti-American. This has been true for decades, even though the United States and Mexico remain economically close. Could a sharp divergence in foreign policy cause Mexico to change its trade policies? Would the United States take retaliatory economic action because of Mexican foreign policy decisions it considered unfavorable? Rather than speculate, what seems implicit from history is that trade and commerce can be isolated from foreign policy by both countries, and each country may allow the other to follow sharply different policies, if communication is maintained and both sides generally agree to preserve normal economic relations as part of a general understanding.

Sectoral Understandings

In 1980 the United States ran a \$1.5 billion surplus in trade in agricultural products, trading off fruit and vegetables from Mexico against wheat and feed grains from the United States. Mexico is one of

the few countries in the world buying U.S. steel in quantity; later in the decade it may conceivably export some steel and steel products. The United States exports a large volume of automobile parts to Mexico, and it will soon begin importing engines and other major automobile components. It does not follow from this that clear understandings are already in place, nor that explicit agreements could easily be reached which would govern trade on a sector-by-sector basis. It does not and will not work that way, on either side of the border. Nor does it appear possible, based upon the information and analyses in this study, that sectors could easily be linked, trading off food supplies for "cooperation" in management of industrial exports. The very complexity and lack of coordination and overarching policy referred to above, together with the American Constitutional division of powers, makes this very difficult. As evidenced in the GATT affair, Mexico also cannot easily speak with one voice.

It does not follow, however, that the United States and Mexico have nothing to gain by looking at the trade relationship sectorally. The natural balances or potential parities exist in broad outline. For Mexico's part, most major sectors are dominated by paragovernment corporations -- CONASUPO, Sedimex, the Mexican national railroad, etc. -- or by an oligopoly of private companies. This makes sectoral understandings more readily possible from the Mexican point of view. No comparable unity or government involvement exists on the U.S. side, so that broad sectoral understandings are difficult to achieve and may, in any event, be non-binding. Nonetheless, it does appear to us that the two countries have not fully explored the possibilities of the benefits of looking at the major sectors on a more systematic basis, particularly with reference to the likely evolution of key sectors over the next decade or so.

In order to elaborate this point, we shall here consider some specific aspects of the trade relationship.

Automobile Parts and Components

Mexico is building an auto industry that is attracting U.S. investment at record rates. With the same automobile selling for twice as much in Mexico as in the United States, profit margins are extremely attractive. Chrysler's Mexican operation is the bright star in its dark night, and the future looks even

better. Today, imports of parts and machinery from the United States boost automobile expansion. In automobiles and component parts the United States enjoyed a favorable trade balance of \$600 million in 1979 and \$1 billion in 1980, and a \$3 billion advantage in 1981 is possible.

However, Mexico insists that this advantage must be only temporary. Mexico's Automobile Decree requires each manufacturer to balance imports with exports, and in certain cases exports must go beyond this balance. American companies are therefore building engine blocks, glass and component factories devoted almost exclusively for export. While much of this production will be headed for "world car" assembly plants in Europe, Mexican production is in some cases the alternative to a plant or another shift in the United States. For example, Nissan's new Tennessee plant will probably draw on supplies from its Mexican operations. This will become a major issue between the two countries in the next two years.

Mexican automotive imports constitute less than one percent of the current \$24 billion U.S. import bill. U.S. auto companies view Mexico, the fastest growing automobile market in the world, as an opportunity for profit and as an advantageous site from which to compete, in a few subassemblies and components, with Europe and Japan. Nonetheless, because the American worker is likely to perceive a loss of employment at a time when the domestic auto industry is facing serious problems of adjustment to energy shocks, global competition, and profound changes in the technology of production (automation and robotics). Mexico's auto decree may be tested by private trade complaints. This may eventually require some kind of settlement or understanding which is based in part on government to government talks. The alternative is a protracted legal battle evolving into great pains for industrial interests on both sides of the border.

The dilemma for U.S. auto workers is that in any event there will be a loss of jobs in the mid 1980s in the automotive industry. If the U.S. companies are to produce small cars profitably and with high quality in the United States, they must copy the Japanese experience and move to high level of automation and robotics in production technology. Another alternative is that U.S. companies concentrate on assembly in the United States, and by components and subassemblies from plants in developing countries, developing further the so-called "world car." In either case, whether production is at home or abroad, there will be

drastic reduction in employment requirements. In such an environment, U.S. workers are likely to do all they can to slow down supply of componentry from Mexico and other developing countries, and keep as many jobs as possible inside the United States.

This probably could very well lead to intensified pressures against Mexico as well as other LDC's in the mid 1980s.

Energy

In November, 1980, Mexico announced its National Energy Plan, which had three important implications for the United States: first, Mexico would limit its production to 2.7 million barrels per day through 1982; second, Mexico would export only half of its oil exports to "any one country." Further, Mexico has made it clear that it intends to use new supplies of oil in the future principally to bargain for technology and turnkey investments projects with countries other than the United States, as it has been doing for several years already.

These oil strategy decisions given lengthy consideration, were seriously taken, and are not likely to be reversed by the incumbent President. Some adjustments probably will be made: the 2.7 million b/d ceiling may have to be raised somewhat and the fifty percent export goal may have to be changed to reflect reality. (Mexican refinery capacity is still limited and demand is growing so quickly that Mexico will actually import gasoline for the next two to three years.) Mexico intends to fulfill its goal of selling only half of its export oil in the United States. This is not perceived in Mexico as a bargaining tool, but rather as a fundamental issue of national independence and vulnerability.

Considering the historic sensitivity of petroleum in the relations, neither country would appear to be well served were the United States to grow to depend of Mexico as it now depends on Saudi Arabia. Large imports from Mexico could well undermine the U.S. drive for self-sufficiency. To this extent, therefore, a concurrence of policy objectives exists. What is more, the United States would not be well served were it to bargain for Mexico to increase production beyond a level which is already inflationary. Not only would the United States be seen as interfering, but it might be proposing a course which in the long run would

weaken Mexico in the manner of Iran and Venezuela, and serve the interests of neither country. As others have observed, energy is a sufficiently sensitive issue that it is best considered obliquely, or as a last item of interest on any U.S. agenda.

Moreover, from the U.S. point of view, to press for too much energy access would assure that Mexico would demand a very high price in terms of access for agricultural and industrial goods -- a price which would generate new instabilities in the relationship from the U.S. side.

This is not to say there are no energy issues to consider in the relationship. Within the broad understanding, there will eventually have to be a place for discussions concerning Mexican access to the United States for Mexican petroleum products (as opposed to crude oil), for emergency supplies, for petrochemical feedstocks, and later in the decade, for additional natural gas. There must also be worked out some means of handling the fundamental difference in oil and gas prices, and its effect on trade flows, without which a continuing battle of trade restrictions and retaliatory Mexican actions can be expected.

Agriculture

Bilateral agricultural trade currently favors the United States with a \$1.5 billion surplus in 1980. The 1980s should see increased trade in agriculture flowing both ways, with the balance continuing to favor the United States. Because of government investments in agricultural processing, Mexico should have the potential to increase exports in this sector and thereby counterbalance an expected continuing need for feed grains from the United States in increasing volumes; Mexico will resist U.S. attempts to export such diverse items as citrus and whiskey; U.S. growers will continue to resist Mexican winter vegetables and other fruits and vegetables which Mexico wishes to market in the United States.

In this environment, an agricultural agreement based on a rough balance seems unlikely, if only because demands and supplies fluctuate with the weather. Nonetheless, this sector is so critical to both countries that a special arrangement governing agricultural trade may become essential to harmonious relations. While immigration has been beyond the scope of this study, we recognize that employment in labor-intensive, export-oriented agricultural products is

one part if only a small part, of the eventual reduction of immigration flows. Agro-industry, has been the main recipient of new government investments for more than two years. While agro-industry is defined in Mexico to include everything from furniture to tequila, from the U.S. perspective the definition is less important than the two principle objectives of these Mexican investments: to provide an adequate diet to millions of Mexicans and to create additional employment. Trade with the United States can foster both these objectives and should be of concern to both countries for precisely this reason.

Other Items of Trade

Only a little more than half of the trade between the United States and Mexico can be traced to agriculture, energy, and automobile components. Trade in the remaining sectors has grown rapidly in the last three years, with no end in sight to the 30-55 percent annual increases in capital goods exports from the United States to Mexico. If there is a de facto balance of economic interests in the relationship, it is between machinery, high technology capital goods, and services from the United States and traditional labor-intensive goods and foodstuffs from Mexico. No statistics have been compiled to indicate how many jobs in the United States can be traced to exports to Mexico, but the number is undoubtedly large and growing. Every kind of industrial and agricultural machine is needed in Mexico. Communications and transportation equipment will account for billions of dollars of trade. It is here, behind the flow of products of greatest notoriety, that the United States can envision a market of enormous importance in the future. By the year 2000 Mexico will have half the population of the United States, a steel industry larger than nearly all European countries, and a very large primary petrochemical industry. The primary external supplier for the construction and support system for Mexican industrial expansion will continue to be the United States.

Mexico is cultivating commercial relations with many other countries in an effort to reduce its dependence on the United States and diversify its commercial relationships and investment ties. Virtually every industrial country, led by Japan and France, has sent trade delegations to Mexico in the past two years, and the ensuing agreements will gradually bear fruit, reducing the U.S. trade share somewhat. The United States could, if it wished, organize its public

and private sector to attempt to retain its traditional share of the Mexican market. Passage of legislation now before the Congress, authorizing bank participation in export trading companies, would aid in this effort. Continued liberal export credit policies by the Eximbank would be needed. Government leadership would help. But if this does not occur, the United States will still capture a dominant share of the market. The United States will get spin-off benefits from projects undertaken by the Japanese or Europeans, and it will benefit from what might be called a "vortex effect" of development. It should also be recognized that the United States will also benefit from diversification politically, as it experiences less exposure as the predominant sources of Mexican capital and technology.

U.S. Trade Policy and Jobs in Mexico

Setting aside the hundreds of thousands of jobs from migrant Mexicans coming into the United States (since that is not part of this study), U.S. policy makers should be aware that at least a million jobs in Mexico are directly attributable to the trade policy of the United States at this time. Here is the composition of that figure:

a. Border Industries -- More than 131,000 Mexicans, most of them young women working an average of six months at a time, owe their jobs to the 635 small plants or businesses which have taken advantage of sections 806.30 and 807 of the U.S. trade laws to establish "border" or in-bond industries. The United States and Mexico established a special taxation regime in which Mexico taxed only the value added to a product, parts of which are brought into Mexico duty-free, assembled there, and returned across the border without duty. This program has been expanded beyond its original confines of the border and its original emphasis on electronics, into interior Mexico, and to its many products. It is popular along the border, but resented by organized labor in the United States.

b. Winter Vegetables -- For more than 10 years the United States has received a large portion of its winter tomatoes from Mexico. Mexican growers see opportunities for additional vegetable and fruit exports (now about 60 percent for tomatoes, a much lesser percentage for other vegetables). As is widely recognized, the remaining supply of winter tomatoes comes from Florida. Owners of both large and small farms

grow tomatoes in Northwest Mexico, and more than 350,000 Mexicans trace their income or employment to winter vegetables. Each year they wait while the Congress, U.S. government agencies, or a court of law decides whether and under what conditions their products can enter the United States. The history of U.S. treatment of Mexican imports even includes episodes of conscious use of market or consumer standards to impede the inflow.

c. Generalized System of Preference (GSP) -- As a developing country, Mexico benefits from the duty-free treatment provided on a select list of items sold in industrialized countries. GSP requires that no one country supply more than half the volume of any import, up to a maximum which is now \$45 million a year. Mexico is one of five main beneficiaries of GSP, all "newly industrialized countries." GSP imports from Mexico come from firms with an average of seven employees, and account for 260,000 jobs. About four percent of U.S. imports come in duty-free under GSP.

Mexico's total labor force is 18 million, meaning that nearly five percent of the jobs in Mexico can be traced to the three programs listed above. All three programs are in some peril.

With regard to the GSP, the Congress has mandated that products from newly industrialized countries (NICs) like Mexico be "graduated" out of duty-free status once they have become internationally competitive, on the reasoning that the comparatively advanced countries should gradually make way for those truly in need of establishing and expanding an export capability. Graduation would be product or product-category specific, not country-by-country, but the net effect of graduation procedures on Mexico could be a significant loss of jobs. Growing Congressional sentiment to accelerate the graduation process resulted in a \$500 million cut-back in GSP treatment for the five NICs. Only \$14 million of these cuts affected Mexico, however, additional graduations for NICs are possible in the future.

Should the Administration wish to develop a policy generally favorable to Mexico, retaining section 806 and 807 and regularizing the winter vegetable trade would be two areas of obvious importance, however fraught with domestic controversy in the United States.

Other Concerns

Other concerns spring directly from the study and carry their own obvious implications. We have discussed the "petroleum syndrome" at great length. For now, the United States, as Mexico's principal external supplier, benefits from Mexico's attempt to use oil revenues to expand rapidly. However, purchases of capital goods at even more accelerated rates, or an accelerated rate of oil production, both carry real dangers to Mexico, whatever the short-term benefits to the United States.

Transportation is Mexico's Achilles heel. It cannot import, export, or conduct internal commerce on the necessary scale using a system antiquated both in terms of equipment and trackage, and utilizing traditional ways of doing business.

As we have noted, Mexico faces a severe shortage of trained manpower. Its educational system is inadequate to provide the skills needed, yet Mexico is reluctant to open its borders to outsiders, as have so many of the oil-rich countries of the Middle East. Thus Mexico experiences a crippling shortage of manpower at the top -- and a top-to-bottom shortage in some urban areas such as Monterrey - while at the same time it shows a structural underemployment level of more than 40 percent.

Mexico is a country where half the population is malnourished. Rural unemployment or underemployment can run as high as 70 percent. Ten years of poor rains have helped convert Mexico from a food exporter to the point where it imported 13 million tons of food in 1979, 98 percent of it from the United States.

All of these are Mexico's problems, and the Mexicans want them to be dealt with on their own terms, using U.S. capital, machines and technology as needed. As one Mexican official said privately, the best contribution the United States can make to Mexico is to get its own house in order, to resume economic growth and fast capital spending. In this environment, he reasoned, the Mexico which is poor, as well as the Mexico which is rich, would benefit, both in its traditional role as supplier and because the United States would be more able to adjust and less likely to turn protectionist.

An Evolutionary Accord

Taking into account those characteristics of the Mexican situation, and of the U.S.-Mexican interactions, a complex rather than simple formula may be best for mutual development of a "framework" of relations. A variation and blend of some of the options outlined early in this part of the report might be considered which would provide an evolutionary framework which will gradually develop a juridical character, aimed at

-- expanding the economic relationships (but not necessarily calling for free trade);

-- reducing the uncertainties inherent in the present context (including a "best efforts" commitment to prior notification and greater transparency);

-- providing means of dispute settlement which are consistent with U.S. law and with Mexican divisions of authority and responsibility;

-- assuring mutual restraint in the event of disagreements, so as to avoid retaliation and escalation of conflicts except under mutually agreed procedures; and

-- facilitating sound private and public planning of the evolution of key sectors, while avoiding "surprises" in the development of investment and trade in these sectors.

Such basic elements could, for instance, be developed into an appropriate declaration of principles which might be made by the leaders of the two countries.

At a second stage, representatives of the two countries might take up present and potential problems in trade relations with a view to creating a framework for their orderly resolution. For example, it might be considered whether present U.S. law and the international code on subsidies really requires differential treatment against some of Mexico's export incentives. The code on subsidies permits special and differential treatment of aids consistent with development needs; and the U.S. law provides opportunity for commitments to be made which are "substantially equivalent to obligations under the Agreement, as determined by the President..." Under certain circumstances, in other

words, some aids could be determined to be consistent with development needs, perhaps taking into account the degree of overvaluation of the peso. A special bilateral agreement could perhaps be negotiated with Mexico which met the "substantially equivalent obligations" test. In these matters, U.S. policy on the specific commitments necessary to meet the test can be adjusted, particularly if this were done in consultation with the key Congressional committees. If Mexico could adopt some set of obligations that met the test, as determined by the President, then an injury test could be provided for in cases of imports from Mexico.

With regard to potential problems, the oil and gas price differentials between Mexico and the United States ought to be discussed now, before import complaints come from the private sector formally, in order that a framework for their orderly resolution be developed. In due course, this may require some legislative action. However, since the same issue arises in relation to Canada, and will no doubt come up in connection with the Middle East and other cheap oil and gas countries later in the 1980s, a peculiarly Mexican solution may prove difficult. In that case, a serious discussion may create the need for a broader consideration of what seems to us a major international trade distortion problem in the later 1980s.

As noted earlier, sectoral plans and prospects might be evaluated in the second stage to determine whether special sectoral arrangements might become necessary. Thus, automotive industry adjustment to new technologies of production and to world car sourcing, together with Mexican export performance requirements, may force consideration of a sectoral agreement (just as the U.S.-Canada automotive agreement became necessary even though neither side really wanted it, and to this day both sides complain about its unfairness to them).

A third phase would involve more specific commitments in tariffs, nontariff treatment, investment policy, migration, and food supply assurances -- and possibly some aspects of energy relations. However, it would be necessary to approach the third phase with great caution, working with the experience of phases one and two, and not on its own. Congress would have to be involved in implementation of such a third phase, since legislative changes would be necessary. The terminology of "strict reciprocity" would have to be avoided, to make such an approach politically feasible for Mexican leaders. Item-by-item negotiations would therefore tend to be counterproductive,

and a more diffuse package of obligations, rights, and trade concessions done as a group might have to be considered.

Gradually, in the second and third phase, the issue may have to be faced of whether the United States should explicitly accept the principle of differential treatment of Mexico as compared with other nations. Given the traditional nondiscriminatory approach of U.S. commercial policy, a shift in orientation would no doubt require a major soul-searching in U.S. policy circles. However, the reality is that there are already special circumstances and special relations with Mexico. Further inclinations in this direction, if they involve issues of law or trade policy principle, could be covered by some kind of free trade area rationale, as noted earlier in this part of the study (following the many precedents set in the GATT by the EC arrangements with various nations, such as the former EFTA countries, applicants for membership, Mediterranean associates, and Lome Convention countries, and by the U.S.-Canada automotive agreement). Such a rationale could easily be subject to differential time-phasing and to selective application by sector, without giving rise to legitimate complaints from other major trading nations. Given the overriding political and security considerations for the United States of maintaining peaceful and orderly relations with bordering nations, this kind of evolution of trade policy thinking may turn out to have growing appeal.

Ultimately, the collision course on which the two nations seem to be moving presents a critical imperative for action. An evolutionary approach growing out of an initial accord, based on general behavioral understandings, may be the most pragmatic and sensitive way of dealing with the mutual interests and relations, while avoiding confrontation.

Two Futures

In conclusion, knowing that no relationship remains in a steady state, and assuming no grand accord is immediately achievable, two courses, one dangerous, one benign, seem to us possible. Along the dangerous path, protectionism in both countries, serious foreign policy differences, immigration crackdowns and immigration violations, energy cutoffs, and trade investment retaliations could make today's relative calm appear in hindsight to be the Periclean

Age. While this possibility might appear fanciful to readers in the United States, General Pershing rode into Mexico twenty years into this century, and nationalization of oil occurred barely 40 years ago. Of more current concern, the inevitably slow process of bringing rural Mexico into the economy, and satisfying a growing urban population when black gold is making some Mexicans rich as Aztec kings, is a task that will challenge even Mexico's vaunted internal cohesion. Mexico has the highest rate of disparity between rich and poor of any country in Latin America. This, coupled with the greatest disparity between any two contiguous nations, along the U.S.-Mexican border, summarizes just how delicate the situation may become before Mexico eventually spreads the economic dividends and becomes a fully modernized industrial nation. As we have indicated earlier, the present trend places the two countries on a collision course. Given the history of the relationship, rigid U.S. reaction based on strict reciprocity will not be accepted by Mexico. Instead, such a policy will intensify the differences and escalate the stakes, without resolving the underlying problems. From a political and security point of view, the present course may eventually prove extremely painful to the United States as well as Mexico.

The second course is one which takes account of the first possibility, and proceeds with the sensitivity, restraint, and complementary growth that could make both countries wealthier and more secure. Within a framework of understanding and cooperation in conflict resolution, with communication that survives even substantial disputes, and with concern for the other's welfare, Mexico and the United States can prosper together.

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